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Photochemically Reactive Organic Compound Emissions from Consumer and Commercial Products

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PHOTOCHEMICALLY REACTIVE ORGANIC COMPOUND EMISSIONS FROM CONSUMER AND COMMERCIAL PRODUCTS

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This report estimates the emissions of volatile organic compounds (VOC) and photochemically reactive organic compounds (PROC) released from the use of consumer products in the States of California and New Jersey, and the New York metropolitan area. The report describes the data sources and methodologies that were used to estimate VOC and PROC emissions from consumer products, and presents emission estimates broken down by consumer product subcategory and geographic region.

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PHOTOCHEMICALLY REACTIVE ORGANIC COMPOUND EMISSIONS FROM CONSUMER AND COMMERCIAL PRODUCTS

FINAL REPORT

November 26, 1986

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1. INTRODUCTION

Pursuant to the Clean Air Act, States are required to attain the Federal ambient ozone standard by 1987. EPA has found that the formation of oxidants (e.g., ozone) is directly related to the emission of photochemically reactive organic compounds (PROCs). Therefore, EPA and the States have initiated control programs to reduce PROC emissions to meet the Federal ozone standard. Organic compounds with high vapor pressures volatilize easily and are known as volatile organic compounds (VOCs). Photoreactive organic compounds (PROCs), a subset of VOCs, are chemically reactive in sunlight. Although substantial controls on PROCs are in effect, parts of California, New Jersey, and New York will not be able to attain the ozone standard unless further PROC emission reductions occur. Preliminary emission estimates indicate that consumer and commercial products represent a significant contribution to the uncontrolled release of PROC. This study was undertaken to determine whether there was potential for emission reductions from the consumer product source category.

The development of an emission reduction strategy requires an inventory of VOC and PROC emissions from consumer and commercial products. Since previous inventories of this type used information dating back to the early 1970s, EPA Regions 2 and 9, and the States of California, New Jersey, and New York are supporting this study. The primary goals of the study are to (1) identify the available secondary reference sources for the inventory, (2) assess the quantity and quality of data which may be obtained from these references for all consumer and commercial products, and (3) accurately determine the quantity of VOC and PROC emissions from consumer and commercial products for three geographical areas. The areas studied are: (1) the State of California; (2) the State of New Jersey; and (2) the New York City metropolitan area, which consists of the five boroughs of New York City, and Nassau, Suffolk, Rockland, and Westchester counties.

This report, along with accompanying tables of emission estimates, fulfills the requirements of Task 4 of the August 30, 1985 Work Plan. Where possible, SAIC has estimated use and composition data for consumer and commercial products (Appendix A). SAIC has also calculated VOC and PROC emissions for "typical" product formulations and individual product categories, and total emissions for all product categories in each of the three assigned regions (Tables 4, 5, and 6).

The estimated emissions assume that all VOC and PROC are released to the atmosphere. However, it is likely that not all such compounds are released immediately upon use, some possibly not at all. A small fraction may remain in the container or become chemically or physically bound in landfills or water systems, thereby preventing release. Finally, some VOC or PROC may be consumed by microbes in sewage systems or septic tanks.

2. DEFINITION OF TERMS

The following are definitions of the terms used in presenting use and emissions data in Tables 4, 5, and 6.

Annual Unit Distribution - Annual unit distribution is defined as the number of units (i.e., containers, bottles, and cans, etc.) that are distributed or produced in a given year. These data are based on the Simmons Market Research Bureau 1983 survey and a 1984 survey conducted by the Chemical Specialties Manufacturers Association. The distribution numbers based on the Simmons survey were calculated by multiplying the estimated population using the product by the quantity of the product used in a given period. The distribution number generally represents all product formulations within the product category.

Average Unit Weight - This is the average weight of all products distributed in a product category. These data are primarily based upon surveys conducted by the Western Aerosol Information Bureau (WAIB, 1982).

Geographic Multiplier - The geographic multiplier is a factor that compares the regional usage of a specific product to the national average. For some products, usage may vary significantly according to geographic location. For example, use of suntan lotions in California is estimated to be 1.16 times the National average. The geographic multiplier is listed as a fraction of the National average, where the National average is 1.00. Thus, multipliers greater than 1.00 indicate usage is higher than the population in general and vice versa for multipliers less than 1.00.

The geographic multipliers were obtained using data from Simmons 1983 Study of Media & Markets. The multipliers were based on data presented for two of the five marketing regions established by Simmons for the study: northeast and Pacific. The northeast States included Connecticut, Maine, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The Pacific States included Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington. For each marketing region, an index was calculated by dividing the percentage of the regional population using the product by the percentage of the total U.S. population using the product. This index was used as the geographic multiplier. Thus, for suntan lotions, the Simmons index for the pacific marketing region was 116% or 1.16. Since California is part of the Pacific region, the geographic multiplier for suntan lotions is 1.16.

National Consumption - National usage data are reported in pounds of product consumed annually. Most data are based on Kline (1981, 1982). Data for all-purpose cleaners and window and glass cleaners were converted from millions of gallons to millions of pounds using a conversion figure of 8.33 pounds per gallon. The consumption figure for shampoos was given by Predicasts, Inc. (1984) to be 2.7 pounds per capita. This was converted to pounds using a National population of 226,545,805.

Photoreactive Organic Compounds (PROCs) - All gaseous chemical compounds that contain the element carbon are defined as reactive by the EPA (Federal Register, 1983) excluding carbon monoxide, carbon dioxide, carbonic acid, carbonates, metallic carbides, methane, 1,1,1-trichlorethane, methylene chloride, trifluoromethane, trichlorotrifluoroethane, dichlorodifluoromethane, trichlorofluoromethane, chlorodifluoromethane, dichlorotetrafluoroethane, chloropentafluoroethane, and ethane.

Population Apportionment - This factor was used to adjust national data to the individual regions. It is a ratio of the population of the region divided by the population of the United States (U.S. Bureau of the Census, 1986). Population bases are: (1) 226,545,805 persons in the U.S., (2) 24,920,000 persons in CA, (3) 10,803,581 persons in N.Y., and (4) 8,376,900 persons in N.J.

Relative Evaporation Rate (RER) - A measure of the volatility of a compound relative to that of butyl acetate. A compound's RER depends upon its molecular weight and vapor pressure. See Section 3 for the mathematical definition.

Seasonal Variation - Variation in the use of a product or category of products from winter to summer was investigated. In most cases, data were not readily available. The only seasonal variations reported here are those for the use of paints and finishes and suntan products. These figures show the use of paint and suntan products in the summer compared with winter usage. The summer tanning season corresponds to May to October in California and June through September along the East Coast.

Total Volatile Organic Compound (VOC) Emissions - An organic compound is classified as volatile if its Relative Evaporation Rate exceeds 0.1 or if data for computing the RER are unavailable and the molecule has fewer than 10 carbons. Low and high VOC emission values are reported for each product subcategory. These are then aggregated into a low and a high total annual VOC emissions estimate.

Weight Fraction VOC or PROC - This number indicates the proportion of VOC or PROC in a given product formulation. Two fractions are generally reported for each product category. The first is the lowest estimate of VOC or PROC emitted from a set of formulations, while the second is the highest estimate of VOC or PROC emitted from the same category. These fractions may come from different product formulations. Weight fractions for each product are given as percent of total weight in the individual product formulations in Appendix A.

3. TECHNICAL APPROACH

The Work Plan identified 11 aerosol and nonaerosol product categories, and numerous subcategories. Tables 4, 5, and 6 report VOC and PROC emissions for products in each of these categories. The 11 product categories are:

Aerosol Spray Products

(1) Insect Sprays
(2) Paints and Finishes
(3) Household Products
(4) Personal Products
(5) Animal Products
(6) Automotive and Industrial Products
(7) Food Products
(8) Miscellaneous Products

Nonaerosol Products

(1) Personal Products
(2) Household Products
(3) Garage Products

3.1 DESCRIPTION OF SOURCES

Composition and usage data for these product categories were derived from the following sources:

Usage Data:

- Chemical Specialties Manufacturers Association, Inc., (1984), Pressurized Products Survey, United States -- Questionnaires for this survey, which reports the number of aerosol units filled during 1984, were returned by 217 companies, representing 88 percent of the industry total.
- Simmons Market Research Bureau, Inc., (1983), Simmons 1983 Study of Media and Markets -- This company carries out annual surveys of product usage in the United States. A representative sample of 19,248 adults, age 18 years and over, living in the coterminous 48 States, was conducted between September 8, 1982 and July 5, 1983.

- Western Aerosol Information Bureau (WAIB) -- This organization is the source of the only comprehensive information available on aerosol product unit size. WAIB was not able to give detailed information about the methodology it used to determine unit size.

- C. H. Kline and Co., Inc., (1981), Consumer Pesticides and Fertilizers -- Presents use and other data based on approximately 180 interviews with competitive suppliers, distributors, raw material suppliers, government agencies, and other trade factors. The survey was also based on an extensive search of published literature and a review of price lists, product descriptions, and other material from suppliers. This source is believed to be the most accurate available for use data.

- C. H. Kline and Co., Inc., (1981), Household Cleansing Products -- These data are based on telephone interviews with 38 major suppliers as well as distributors, government agencies, and other trade factors. This source is believed to be the most accurate available for use data.

Composition Data:

- Gosselin, Robert E., Robert P. Smith, and Harold C. Hodge, (1984), Chemical Toxicology of Commercial Products, 5th ed. Williams and Wilkins, Inc., Baltimore, MD -- This work, which presents "typical" formulations for consumer products, was the source of composition data for several product categories.

- Wilkenson, J.B. and R.J. Moore, eds., (1982), Harry's Cosmeticology, 7th ed., Chemical Publishing, New York -- This volume also presents typical product formulations.

- Micromedex, (1984), Poisindex -- source of composition data for a portion of "paints and finishes."

- Novak et al., (1985), Aerosol Age -- source of composition data for the remainder of "paints and finishes."

- Chalmers, Louis, revised by Peter Bath, (1979), Household and Industrial Chemical Specialties, vols. I and II, Chemical Publishing, New York -- This was the only available source of formulas for several product categories.

3.2 METHODOLOGY FOR DETERMINING VOLATILITY OF VOCs

A variety of formularies and market research volumes were examined, and several associations were contacted, to obtain data on product use and composition. Beacause use data were not available for individual product formulations, high and low VOC and PROC emissions were estimated for each product subcategory. To develop these estimates, each formula was assumed to be the representative of the subproduct category. The formula with the lowest VOC and PROC emissions levels was then used as the low estimate and the formula with the highest VOC and PROC emissions levels was used as the high estimate.

The Relative Evaporation Rate (RER) index was used to determine the consumer product constituents that should be considered "volatile" and those that should be considered "nonvolatile." The RER is defined as (Stratte et al., 1978):

$$\text{RER} = 0.8217 \times (\text{Vapor Pressure}) \times (\sqrt{\text{Molecular Weight}}).$$

This index expresses the volatility of the various organic compounds relative to the volatility of $\bar{n}$-butyl acetate (RER = 100). Molecular weights were located in the Handbook of Chemistry and Physics (Weast and Astle, 1981), the Handbook of Environmental Data on Organic Chemicals (Verschueren, 1977), and in the on-line data base HEILBRON, which is accessed through Dialog Information Services, Inc. The HEILBRON data base summarizes information from the Dictionary of Organic Compounds, 5th edition (1982). Compound names and formulas were identified using the EPA series, Toxic Substances Control Act Chemical Substances Inventory, Volumes II, III, and Cumulative Supplement (USEPA, 1980).

Many compounds were identified in product formulas only as proprietary ingredients, such as "DC-193 fluid," "PVP-VA copolymer E-735," or "carbopol 934." Others were listed generically in classes, such as alcohol, essential oils, or chlorinated solvents. Where possible, the representative compounds for each classification were used as surrogates for these classes and volatility was decided on the basis of the surrogate. For example, isohexane was used for "C6 isomers" and butyl benzyl phthalate was used for "plasticizers." CHEMNAME, another on-line data base, was searched for Chemical Abstracts Service (CAS) registry numbers and molecular weights of proprietary named chemicals. Some compounds which could not be located using the other sources were identified in this manner. The CAS numbers provided reference points for locating physical and chemical data in the HEILBRON data base.

Vapor pressures not available through one of the previously mentioned sources were computed by using the following formula, which relates a compound's vapor pressure at 20°C to its boiling point at 760 mm atmospheric pressure (Hass and Newton, 1981):

$$2.8808 - \log p = \frac{\emptyset \Delta t}{293.1 - 0.15\ \Delta t}$$

where

Δt = boiling point(°C) - 20°C
$\log p$ = logarithm of the observed pressure in mm Hg
$\emptyset$ = entropy of vaporization at 760 mm.

The entropy of vaporization is determined from a set of curves presented by Hass and Newton. For compounds whose boiling points are reported at a different pressure than 760 mm, the boiling point at 760 mm must first be iteratively obtained by a rewritten form of this formula, so that the above computation may be carried out:

$$B_{760} = B_p + (273.1 + B_p)(2.8808 - \log p)/[\emptyset + 0.15(2.8808 - \log p)]$$

where

B_p = the observed boiling point at pressure P (mm)

Note that $\emptyset$ is a function of the boiling point. Therefore, the equation must be solved iteratively until successive values of B_{760} are very close (within 0.1°C in our case).

Most molecular formulas could be identified, but boiling points and vapor pressures frequently were not reported in the literature. Because unknown compounds needed to be systematically defined as "volatile" or "nonvolatile," long-chain hydrocarbons (e.g. waxes, oils, and some esters) were considered nonvolatile. "Long-chain" generally meant 10 or more carbon atoms. Data were lacking for a large number of the compounds, many of which were fatty acid esters. Polymers and resins were also assumed to be nonvolatile. All nonvolatile compounds were assigned a vapor pressure of 0 mm, so that their

RERs were also 0. Substances known to be mixtures of volatile compounds, such as "mineral spirits" or Stoddard solvent, were arbitrarily assigned a molecular weight of 50 and a vapor pressure of 50 mm in order to generate RERs indicative of volatile compounds. The RERs for these substances were 290.515. Finally, compounds for which no physical data were available were assumed to be nonvolatile.

Selection of a dividing line between "volatile" and "nonvolatile" was of necessity arbitrary, since volatility was quantified by a relative measure, the RER. For convenience, the lower limit of volatility was set at RER = 0.1, or three orders of magnitude below that of butyl acetate. Examination of compounds whose RERs lie on either side of 0.1 confirmed that the choice was reasonable. Most of the compounds with RER <0.1 are solids at ambient temperatures (e.g. thymol and benzoic acid) or are polar liquids with boiling points above 200°C (e.g. diethylene glycol and myristil alcohol). Compounds whose RERs slightly exceed 0.1 are liquids, most of which are known to be volatile; these include ethylene and propylene glycols. All organic compounds in the listed products, except methylene chloride, 1,1,1-trichloroethane, and carbon dioxide, were considered reactive. Product category and total emissions in Tables 3, 4, and 5, and percentages emitted in Appendix A are reported separately for VOC and PROC.

4. UNCERTAINTIES/DATA GAPS

The analysis estimated VOC and PROC emissions from consumer and commercial products by combining composition data with distribution or use data for product subcategories. Composition data within each subcategory were further aggregated from individual formulas; while national usage was frequently derived from several types of products, such as aerosol and non-aerosol. Thus, at each stage of analysis, aggregation error enters the result. The extent of this type of error is not known, although it varies from one product subcategory to another. Table 1 shows the availability of data for each product subcategory. The following list identifies sources of uncertainty for composition and usage data:

Usage Data - The available use data often encompassed broad product categories and could not be disaggregated to individual products and formulations within each subcategory. In addition, use data were not readily available for many subcategories. This was particularly true for nonaerosol products. Several product subcategories were therefore merged and emissions calculated on the basis of these merged data. When aerosol and nonaerosol products were combined, they were reported under aerosol/nonaerosol in Tables 4, 5, and 6.

Population Apportionment - The data used for the population apportionment comes from 1984 and 1985 U.S. Bureau of Census population estimates. The data were obtained from telephone conversations with Bureau of Census staff. SAIC believes that this data is the most accurate available.

Geographic Multipliers - The geographic multipliers are based on the Simmons 1983 Study of Media Markets. The study interviewed 19,248 adults and is representative of the U.S. population, age 18 and over living in the contiguous 48 States. The interview period was from September, 1982 through July, 1983.

Factors influencing the accuracy of the geographic multiplier are the number of States and the population in each marketing region, as well as the frequency or quantity of usage within each marketing area. For example, California represents over 65 percent of the population in the Pacific marketing region. We believe that the population of States outside California, but within the Pacific marketing region, would have little influence on the accuracy of the California data. However, New York and New Jersey each represent only 36 percent and 15 percent respectively of the northeast marketing region. Thus, other State populations could have a significant impact on the accuracy of the usage data. Although we are uncertain how this would affect typical product usage in the two States compared to the Simmons regional data, we believe the influence in the estimated error to be minimal. Our belief is based on Simmons' judgment in establishing homogeneous marketing areas (i.e., similar consumer product usage patterns throughout a marketing area).

Product use within each region varies more than use in all regions combined. Use within regions may vary from 15 percent less to 20 percent greater than the national average. However, an average use weighted by State population does not differ greatly from a nonweighted use, within an entire region. Therefore, it is reasonable to assume that the statewide geographic multiplier is similar to the regional one.

The error in estimating PROC from the geographic multiplier is small compared to other uncertainties, such as those present in the formulation and consumption data.

Formulation Data - The accuracy of the formulation data presented in this report cannot be easily assessed. For any given product category, a wide range of formulas may be in use. These formulations vary significantly according to the quality of the product and its specific use. Many of the formulas, however, are proprietary or contain compounds that are proprietary. Although formulations for specific brands were included when available, most of the ones available for this report were "generic" formulations provided to our references by the manufacturers of the product ingredients. These formulations were verified where possible by a shelf survey. Few product labels show percent by weight formulations. A somewhat larger number list ingredients. However, generic terms are often used for these ingredients (e.g., inert ingredients, volatile organic compounds, driers, alcohol, or plasticizer). Frequently, only the active ingredient is listed on the label. All formulas are assumed to be representative of their product subcategory. The formula data were often six to ten years old. Even where formularies were recent, the reported composition was probably two or three years behind current production lines. The degree of obsolescence of these formulas is difficult to judge. Formulas are continually changing over time. These changes are caused by improvement in product formulations, regulations such as the chlorofluorocarbon ban, and the changing cost of intermediates. For the purposes of this report, product lines are assumed to evolve slowly and that all recent arrivals contain similarly volatile species.

Other formula uncertainties include the following:

- Many formulations included chlorofluorocarbons as the propellant although they have been banned in most consumer products. Attempts were made to verify, through industry sources, the various assumptions made regarding the type and quantity of the replacement propellant through industry sources.
- In several cases aerosol and nonaerosol formulations were combined. This was necessary because only aggregated use data were available. Composition and weight might be substantially different for aerosol and nonaerosol products.
- Formulations for many products consisted of percentage ranges for one or more ingredients. It was often difficult to clearly delineate the lower and upper bounds of volatile compounds for these products. This problem arises because a decrease in one ingredient must be compensated for by an increase in one or more other ingredients. Some of the replacement ingredients may be volatile while others are nonvolatile. Our best professional judgment was used in such cases. It is likely that results were not substantially affected in these cases.
- Very few nonaerosol formulas were available for this report.
- Product formulation descriptions occasionally aggregate dissimilar ingredients, reporting the percent by weight of groups rather than of individual compounds. For example, "xylol" and "driers" were combined for the paints and finishes product category, even though they are different compounds and have very different volatilities.
- Product ingredients were frequently reported as classes of compound, such as "alcohol" and "plasticizer." We had to choose a "typical" ingredient and decide volatility on the basis of this surrogate.

- SAIC estimated the low and high VOC and PROC emissions for each product subcategory by finding the formulation with the lowest weight percent and the one with the highest weight percent VOC and PROC. This means that subcategories with many formulations may have a considerable range between the low and high emission estimate. One particularly troublesome subcategory was insecticides, which comprised primarily space insecticides, but also included one dust and one target aerosol. PROC varies from 0 percent in one formula to 100 percent in another.
- Although a number of other formulas were available in Gosselin (1985), we chose "typical" formulas for product subcategories to reduce the data set to a manageable size. Variation in chemical content from the formulas that were not chosen to those that were used generated additional uncertainty.

Ratio of Seasonal Variation - The seasonal variation of product usage was only included in the paint and suntan products calculation. The ratio was not included in other consumer product subcategories because of a lack of data and, in many cases, the small likelihood of any significant variation between seasons. For paint products, we assumed that 57.5 percent was used during the ozone season. These figures are based on monthly sales figures collected by the Bureau of census and are believed to be accurate. For suntan products, 100 percent was assumed to be used during the ozone season. Within the states of New York and New Jersey, use outside of the summer season was assumed to be negligible. In California, we assumed that use outside of the summer season would be minimal. Even though the warm climate permits sunning during the entire year, the less direct sun would reduce the need for protective sunscreens or tanning lotions.

TABLE 1. AVAILABILITY OF DATA BY PRODUCT SUBCATEGORY[1]

Category	Units Distributed	Average Product Weight	National Consumption	Population Apportionment	Geographic Multiplier[2]	Product Formulations
Insecticides	NA	NA	Yes	Yes	No	Yes[3]
Insect Repellants	NA	NA	Yes	Yes	No	Yes[4]
Moth Control Products	NA	NA	Yes	Yes	No	Yes[4]
Animal Insecticides	NA	NA	Yes	Yes	No	Yes[4,5]
Herbicides and Fungicides	NA	NA	Yes	Yes	No	Yes
Paints, Primers, Varnishes	Yes	Yes	NA	Yes	Yes	Yes[6]
Paints and Finishes - Related Products	Yes	Yes	NA	Yes	No	Yes
Room Deodorants and Disinfectants	Yes[7]	Yes	NA	Yes	Yes	Yes
Tile and Bathroom Cleaner	NA	NA	Yes	Yes	No	Yes
Oven Cleaners	NA	NA	Yes	Yes	Yes	Yes
Rug and Upholstery Cleaner	NA	NA	Yes	Yes	No	Yes
All Purpose Cleaner	NA	NA	Yes[8]	Yes	Yes	Yes
Window and Glass Cleaner	NA	NA	Yes[8]	Yes	Yes	Yes
Laundry Products - aerosol	Yes	Yes	NA	Yes	No	Yes
Laundry Products - aerosol and nonaerosol	NA	NA	Yes	Yes	No	Yes
Shoe Polishes, Waxes, and Colorants	NA	NA	Yes	Yes	No	Yes

TABLE 1. AVAILABILITY OF DATA BY PRODUCT SUBCATEGORY[1] (Continued)

Category	Units Distributed	Average Product Weight	National Consumption	Population Apportionment	Geographic Multiplier[2]	Product Formulations
Other household Products - aerosols	NA	NA	Yes	Yes	Yes	Yes[9]
Other household Products - aerosols and nonaerosols						
Adhesives	NA	NA	Yes[14]	Yes	No	Yes
Caulking and Sealing Compounds	NA	NA	Yes[14]	Yes	No[2]	Yes
Shaving Cream	Yes	Yes	NA	Yes	Yes	Yes
Hair Products - aerosols	Yes	Yes	NA	Yes	Yes[10]	Yes
Other Hair Care Products	NA	NA	Yes[11]	Yes	Yes	Yes
Pharmaceuticals	Yes	Yes	NA	Yes	Yes[12]	Yes
Colognes, Perfumes, Aftershaves	Yes	Yes	NA	Yes	Yes	Yes
Personal Deodorants	Yes	Yes	NA	Yes	Yes	Yes
Other Personal Care Products	Yes	Yes	NA	Yes	Yes	Yes
Automotive Cleaners	Yes	Yes	NA	Yes	No	Yes
Automotive Engine Degreasers	Yes	Yes	NA	Yes	No	Yes[3]
Lubricants and Silicones	Yes	Yes	NA	Yes	No	Yes
Undercoatings	Yes	Yes	NA	Yes	No	Yes
Brake Cleaners	Yes	Yes	NA	Yes	No	No
Tire Inflator and Sealant	Yes	Yes	NA	Yes	No	No

TABLE 1. AVAILABILITY OF DATA BY PRODUCT SUBCATEGORY[1] (Continued)

Category	Units Distributed	Average Product Weight	National Consumption	Population Apportionment	Geographic Multiplier[2]	Product Formulations
Carborator and Choke Cleaner	Yes	Yes	NA	Yes	No	Yes[3]
Engine Starting Fluid	Yes	Yes	NA	Yes	No	No
Auto Windshield Washer Fluid and Deicer	Yes[1][3]	Yes[1][3]	NA	Yes	No	Yes[1][3]
Floor Polishes and Waxes	NA	NA	Yes	Yes	Yes	Yes
Metal Cleaners and Polishes	NA	NA	Yes	Yes	No	Yes
Automotive Antifreezes	NA	NA	Yes	Yes	No	Yes
Car Polishes and Waxes	Yes	Yes	NA	Yes	Yes	Yes
Laundry Products	NA	NA	Yes	Yes	No	Yes
Household Polishes	NA	NA	Yes	Yes	Yes	Yes

[1] The data for all product categories are subject to the uncertainties and limitations described in the text. Other limitations and assumptions pertaining to specific categories are noted below and are further explained in the text.

[2] Where the goegraphic multiplier was not available, the value 1.0 was used for the purposes of the calculations.

[3] Because complete formula data was not available for some aerosols, the percentage of propellant was estimated using data from WAIB and CSMA. See text for methodology and assumptions.

[4] The formulas available for the report showed a large percentage of inert ingredients. These inert ingredients may or may not include propellants and other VOCs. See text for further explanation.

[5] Some of the formulas had composition data that did not equal 100%. In these cases, half of the unknown ingredients were assumed to be volatile.

TABLE 1. AVAILABILITY OF DATA BY PRODUCT SUBCATEGORY[1] (Continued)

[6] For the purposes of emissions calculations, halogenated hydrocarbons were replaced by aliphatic hydrocarbons in some formulas. See text for further explanation.

[7] See text for methodology of this calculation.

[8] See text for methodology of this calculation.

[9] Not for all products

[10] For hair spray only.

[11] See text for methodology of this calculation.

[12] For fungicides only.

[13] For Deicer only.

[14] Includes industrial as well as consumer adhesive use.

5. RESULTS

VOC or PROC emissions were computed using the following two formulas:

Total VOC or PROC Emissions =

1. (units distributed) (avg. prod. wt.)
   (pop. apport.) (geogr. mult.) (wt. fraction VOC or PROC)
2. (National consumption) (pop. apport.)
   (geogr. mult.) (wt. fraction VOC or PROC)

Sample calculations illustrating equation 1, for a low PROC emissions estimate and a high PROC emissions estimate for pharmaceuticals in California are:

1. PROC Emissions low est. = $(43.7 \times 10^6$ units$)(0.25$ lb$)(0.11)(1.08)(0.70)(1/2 \times 10^3$ tons/lb$)$

   = 454.26 tons

   PROC Emissions high est. = $(43.7 \times 10^6$ units$)(0.25$ lb$)(0.11)(1.08)(0.99)(1/2.0 \times 10^3$ tons/lb$)$

   = 642.46 tons

Sample calculations illustrating equation 2, for a low PROC emissions estimate and a high PROC emissions estimate for all-purpose cleaners in California are:

2. PROC Emissions low est. = $(512 \times 10^6$ lb$)(0.11)(1.07)(0.02)(1/2 \times 10^3$ tons/lb$)$

   = 602.62 tons

   PROC Emissions high est. = $(512 \times 10^6$ lb$)(0.11)(1.07)(0.41)(1/2 \times 10^3$ tons/lb$)$

   = 12353.79 tons

The molecular weights, boiling points, vapor pressures and RER's for the chemical compounds listed under product formulations in Appendix A are arranged in alphabetical order in Table 2. The compounds have been reordered numerically by RER in Table 3, in order to more readily discern the division between volatile and nonvolatile compounds.

We decided to use low VOC/PROC and high VOC/PROC emissions rather than some form of VOC/PROC weights by product type, which would then be multiplied by the distribution or consumption data to yield the emission total for a given subcategory. It was felt that the data uncertainties, discussed earlier in the report, both within products and within product subcategories, were so large that such results would be highly misleading. For example, it was not possible to know how widely an individual product, versus other products within a subcategory, was distributed in each region. Given these problems, any weights which might be applied to the distribution figures, and the emission estimates that would result, would present a spurious picture of the accuracy of these estimates. For this reason, a range of values depicting emission boundaries would make the reader more aware of the data limitations.

Annual VOC and PROC emissions are presented in Tables 4, 5, and 6. Low and high estimates are based upon the likely range of VOC or PROC emissions in each product category. For example, the ratio of VOC present in formulations in "paints and finishes" in California ranges from 0.73 to 0.87 and is entered under "weight fraction VOC." The appropriate fractions are multiplied to yield annual low and high estimates for each product subcategory. The low and high weight fractions were chosen by examination of the weight percents under the product formulas listed in Appendix A. If formulas 1 and 4 were chosen for a particular product subcategory, then formulations 1,4 were listed in Tables 4, 5, and 6 for that subcategory. Product category subtotals were obtained by summing VOC and PROC emission estimates for subcategories. Addition of product category subtotals produced total emission estimates for each region.

Tables 4, 5, and 6 report data for all product categories and subcategories listed in the August 30, 1985 Work Plan, when data were available. Where data were not available or incomplete, we listed NA in the emission estimate column. Aerosol food products were omitted from the final emission inventory since the propellent used in these products is nitrous oxide and therefore not an organic compound (Kirk-Othmer, 1978).

TABLE 2
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
2-FURALDEHYDE, 2,3:4,5-BIS-(2-BUTYLENE) TETRAHYDRO	307		204.27	.00	.01	
2,4 BIS (ISOPROPYLAMINO)-6 METHOXY-S-TRIAZINE					0.00	
2,4,5-TRICHLOROPHENOXYACETIC ACID, POTASSIUM SALT					0.00	SALT-ASSUMED NONVOLATILE
4-AMINO-3,5,6-TRICHLOROPICOLINIC ACID					0.00	ASSUMED NONVOLATILE
5-BENZYL-3-FURYL.....					0.00	NO DATA - ASSUMED NONVOLATILE
AC POLYETHYLENE 629				0.00	0.00	LARGE POLYMER
ACETIC ACID	118.1		60.05	10.63	67.68	
N-ACETYLETHANOLAMINE			50.00	50.00	290.51	
ACETONE	56.2		58.08	132.49	829.65	
ACRYLIC RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
ACRYSOL LEVELING AID					0.00	NO DATA - ASSUMED NONVOLATILE
ADIPIC ACID					0.00	HIGH-C FATTY ACIDS NONVOLATILE
ALCOHOL 740 P			50.00	50.00	290.51	
ALCOHOL-SOLUBLE LANOLIN				0.00	0.00	HIGH-C FATTY CMPDS NONVOLATILE
ALIPHATIC HYDROCARBONS			86.17	50.00	381.38	USED HEXANE AS REPRESENTATIVE
ALIPHATIC THINNER			86.17	50.00	381.38	USED HEXANE AS REPRESENTATIVE
ALKYD RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
ALKYL ARYL SODIUM SULFONATE				0.00	0.00	SALT
ALKYL DIETHANOLAMINE			88.13	.01	.07	USED ETHYL DIETHANOLAMINE
ALKYLDIMETHYLBENZYLAMMONIUM					0.00	NO DATA - ASSUMED NONVOLATILE
ALKYLDIMETHYLBENZYLAMMONIUM CHLORIDE					0.00	SALTS ASSUMED NONVOLATILE
ALLETHRIN, D-TRANS	302.413				0.00	HIGH-CARBON ESTER-NONVOLATILE
ALUMINUM PHENYLSULFONATE				0.00	0.00	SALTS ASSUMED NONVOLATILE
AMINES			73.14	200.00	1405.47	SURROGATE=DIETHYLAMINE
2-AMINO-2-METHYL PROPANOL	165.5		89.14	.33	2.53	
AMMONIUM CITRATE				0.00	0.00	SALT ASSUMED NONVOLATILE
AMMONIUM LAURYL ETHER SULPHATE				0.00	0.00	HIGH-CARBON SALT
AMMONIUM OXALATE			142.11	0.00	0.00	NONVOLATILE SALT
AMMONYX 4002				0.00	0.00	VERY HIGH-CARBON COMPOUND
AMP	165		89.14	.44	3.41	
AMPD	151.2	10	105.14	.00	.00	
AMPHOMER				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
AMYL ACETATE	148	737	130.20	3.05	28.55	USED N-AMYLACETATE
ANTARON FC-34				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
AROMATIC HYDROCARBONS			92.10	22.00	173.49	SURROGATE = XYLENE
AROMATIC KETONE SOLVENT			92.10	22.00	173.49	SURROGATE = XYLENE
BAYGON			209.24		0.00	CRYSTALLINE-ASSUMED NONVOLATILE
BEESWAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
BENZETHONIUM				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
BENZOIC ACID	249,133	10	122.13	.00	.03	
BENZYL BENZOATE	323.5		212.25	.00	.00	
O-BENZYL-P-CHLOROPHENOL	161	3.5	218.68	.00	.00	
BIOCIDE					0.00	NO DATA - ASSUMED NONVOLATILE
BROMOCIL					0.00	SOLID - ASSUMED NONVOLATILE
BUTADIENE-STYRENE COPOLYMER				0.00	0.00	LARGE POLYMER NONVOLATILE
BUTANE	-.1		58.12	1544.67	9676.33	

TABLE 2 (Continued)
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
BUTYL CELLOSOLVE	170		118.17	.60	5.36	E.G. MONOBUTYL ETHER
C1.S.P. COMPOUNDS					0.00	NO DATA - ASSUMED NONVOLATILE
CALCIUM THIOGLYCOLATE TRIHYDRATE				0.00	0.00	SALTS ASSUMED NONVOLATILE
CALGON					0.00	NO DATA - ASSUMED NONVOLATILE
L-CAMPHOR	SUBLIMES @		152.24	.28	2.81	
CARBARYL				0.00	0.00	NONVOLATILE CRYSTAL AT ROOM TEMP
CARBITOL	202		134.20	.21	1.99	
CARBOPOL 934				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
CARBOXYMETHYL CELLULOSE				0.00	0.00	LARGE POLYMER
CARNAUBA WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
CARTARETINE F4					0.00	NO DATA - ASSUMED NONVOLATILE
CATIONIC CELLULOSE				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
CELLOSOLVE ACETATE	156		132.16	1.20	11.34	
CELLULOSE ACETATE BUTYRATE				0.00	0.00	LARGE POLYMER
CERESIN					0.00	NO DATA - ASSUMED NONVOLATILE
CETYL ALCOHOL, FLAKES	190	15		0.00	0.00	HIGH-CARBON ALCOHOL - NONVOLATILE
CHLOR-AROMATIC SOLVENTS			112.56	8.80	76.72	SURROGATE=MONOCHLOROBENZENE
CHLOR. PARAFFIN PLASTICIZER					0.00	SURROGATE=BUTYL BENZYL PHTHALATE
CHLORDANE			409.78		0.00	FROM STRUCTURE, PROBABLY NON-VOL
CHLORINATED SOLVENTS			50.00	50.00	290.51	
CHLOROSULFONATED POLYETHYLENE					0.00	POLYMERS ASSUMED NONVOLATILE
CITRIC ACID	DECOMPOSES		192.12	0.00	0.00	ASSUMED NONVOLATILE
COCAMINO BETAINE				0.00	0.00	LONG-CHAIN POLYMER
COCONUT AMIDOPROPYL- 3-DIMETHYLAMINE BETAINE				0.00	0.00	LONG-CHAIN POLYMER
COCONUT OIL AMINE				0.00	0.00	HIGH-CARBON
COLOR				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
COLOR MIX					0.00	NO DATA - ASSUMED NONVOLATILE
CONDANOL (DBS,DLS,MLS,SB/L)				0.00	0.00	NONVOLATILE SALT
COPPER NAPHTHENATE					0.00	METALLIC SALT
COPPER UNDECYLENATE				0.00	0.00	HIGH-CARBON SALT - NONVOLATILE
CRESOL (O-,M-,P-)			108.13	.11	.96	RER DERIVED FROM AVG RER'S
CROMEEN				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
CRYSTALLINE WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
CUBE RESINS				0.00	0.00	RESINS ASSUMED NONVOLATILE
CYCLOPROPANE CARBOXYLATE					0.00	USED CYPOTHRIN (HIGH-CARBON)
D,L-CAMPHOR	SUBLIMES		152.24	.28	2.81	
D-CAMPHOR	SUBLIMES @		152.24	.28	2.81	
DC 193 FLUID				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
DDVP	140	20	220.98	.01	.11	
DEHYDROGENATED RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
DEODORANT			50.00	50.00	290.51	
DETERGENT				0.00	0.00	SURROGATE=SODIUM LAURYL SULFATE
N,N-DIALKYL-M-TOLUAMIDE	160	19	191.27	.00	.02	USED N,N-DIETHYL-M-TOLUAMIDE
DIBUTYL PHTHALATE	340		278.35	.00	.00	
O-DICHLOROBENZENE	180.5		147.00	.89	8.89	
DICHLOROMETHANE	41		84.93	349.00	2642.83	SAME AS METHYLENE CHLORIDE
DICHLOROPENTANE			141.04	14.02	136.81	RER DERIVED FROM AVG RER'S
DIETHYLENE GLYCOL	245		106.12	.00	.02	

TABLE 2 (Continued)
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
DIETHYLENE GLYCOL MONOMETHYL ETHE	159		120.15	1.88	16.96	
DIMETHYCONE COPOLYOL				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
DIMETHYL ETHER	-25		46.70	3581.69	20112.19	
DIMETHYLENE OXIDE			44.05	1095.00	5971.73	
DIOCTYL PHTHALATE PLASTICIZER	385		390.56	.00	.00	
DIPROPYLENE GLYCOL	292/232		134.20	.01	.10	RER SHOULD BE < 0.1
DIPROPYLENE GLYCOL MONOMETHYL ETH	187.2		162.23	.46	4.76	
DITHIO-BIS-STEARYL PROPIONATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
DODECYL BENZENE SULFONATE				0.00	0.00	HIGH-CARBON ESTER
DOW 276-V9					0.00	NO DATA - ASSUMED NONVOLATILE
DRIERS				0.00	0.00	ASSUMED TO REMAIN IN THE COATINGS
DUREZ (14000,16470,22008)				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
DUREZ (19788,12686,12687)				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
DUREZ (26141,26789,26799)				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
DUREZ 7421A				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
EDTA					0.00	NO DATA - ASSUMED NONVOLATILE
ELASTOMERIC BINDER					0.00	POLYMERS ASSUMED NONVOLATILE
EMOLLIENT				0.00	0.00	PROBABLY NONVOLATILE
EMULPHOR ON-870					0.00	NO DATA - ASSUMED NONVOLATILE
EMULSIFIERS, HUMECTANTS, WAXES				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
ENDOSULPHAN					0.00	NO DATA - ASSUMED NONVOLATILE
ESSENTIAL CEDAR OIL					0.00	NO DATA - ASSUMED NONVOLATILE
ESSENTIAL OIL			50.00	50.00	290.51	
ESTERS AND KETONES (ACETONE)			50.00	50.00	290.51	
ETHANOL	78.5		46.07	43.90	244.84	
ETHANOLAMINE	172		61.08	.40	2.57	
ETHOXYLATE TRIDECYL ALCOHOL				0.00	0.00	LONG-CHAIN ALCOHOL
ETHOXYLATED FATTY ALCOHOL SULFATE				0.00	0.00	HIGH-CARBON ASSUME NONVOLATILE
ETHYL ALCOHOL	78.4		46.07	43.90	244.84	
ETHYL ALCOHOL OP	78.4		46.07	43.90	244.84	SAME AS ETHANOL
ETHYLENE DICHLORIDE	83.5		99.00	61.00	498.72	
ETHYLENE GLYCOL	198		62.10	.06	.39	
ETHYLENE GLYCOL MONOBUTYL ETHER			118.17	.60	5.36	
ETHYLENE GLYCOL MONOETHYL ETHER	135		90.10	3.80	29.64	
ETHYLENE GLYCOL DISTEARATE				0.00	0.00	LONG-CHAIN ESTER
2-ETHYL-1,3-HEXANEDIOL	244		146.23	.00	.02	
2-ETHYL HEXYL SALICYLATE				0.00	0.00	HIGH-CARBON ACID - NONVOLATILE
FATTY ACID AMIDES				0.00	0.00	SURROGATE=NYLON; ASSUMED NONVOLAT
FATTY ACID SOAP				0.00	0.00	SOAPS ASSUMED NONVOLATILE
FISH OIL				0.00	0.00	ASSUMED NONVOLATILE
FLUILAN				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
FOAM STABILIZERS					0.00	NO DATA - ASSUMED NONVOLATILE
FOLPET	296.555				0.00	CRYSTALLINE-ASSUMED NONVOLATILE
FORMALDEHYDE	-20		30.00	3243.38	14597.26	
FORMALIN	-20		30.00	3243.38	14597.28	
FRACTAL A					0.00	NO DATA - ASSUMED NONVOLATILE
FRAGRANCE			50.00	50.00	290.51	NO DATA - ASSUMED VOLATILE
FRAGRANCE, DYE			50.00	50.00	290.51	
GANTREZ ES 225 OR ES 425				0.00	0.00	PROBABLY A RESIN - NONVOLATILE

TABLE 2 (Continued)
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
GELVA (TS 22,23,30,31,85)					0.00	POLYVINYL ACETATE RESIN
GLYCEROL	DECOMPOSES @ 290		92.11	.00	.00	
GLYCOL ETHER			90.10	3.80	29.64	SURROGATE=E.G. MONOETHYL ETHER
GRANULAR MINERAL BASE					0.00	SOLID - ASSUMED NONVOLATILE
HALOGENATED HYDROCARBON PROPELLAN			50.00	50.00	290.51	
HARD WAXES				0.00	0.00	WAXES ASSUMED NONVOLATILE
HOECHST WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
HUMECTANTS				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
HYDROCARBON PROPELLANT			58.12	1544.67	9676.33	SURROGATE=BUTANE
HYDROGENATED RESIN ESTER				0.00	0.00	RESINS ASSUMED NONVOLATILE
HYDROXYALKYL CELLULOSE (KLUCEL HA				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
INERT INGREDIENTS (PESTICIDES)					1511.56	RER=WTD AVG OF TYPICAL INGRED.(2)
ISOBUTANE	-.5		58.12	1566.19	9811.14	
ISOBUTYLENE POLYMERS					0.00	POLYMER - ASSUMED NONVOLATILE
ISOOCTYL ESTERS					0.00	FAIRLY HIGH CARBON ESTER
ISOPARAFFINIC SOLVENT	60.3		86.18	168.34	1284.09	SURROGATE = ISOHEXANE
ISOPROPANOL	82.4		60.10	34.82	221.79	
ISOPROPYL ALCOHOL	82.4		60.10	34.82	221.79	
ISOPROPYL MYRISTATE	192.6	20	270.46	0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
O-ISOPROXYPHENYL METHYLCARBAMATE				0.00	0.00	C11 COMPOUND ASSUMED NONVOLATILE
KELTHANE	370.49				0.00	CRYSTALLINE-ASSUMED NONVOLATILE
KELZAN				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
KEROSENE			50.00	50.00	290.51	KNOWN TO BE VOLATILE
KOSOL				0.00	0.00	STARCH (POWDER)
KP-140					0.00	NO DATA - ASSUMED NONVOLATILE
LANETO 100				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
LANOLIN				0.00	0.00	ASSUMED NONVOLATILE
LATEX POLYMER ACRYLIC RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
LAURIC ACID	131	1	200.33	0.00	0.00	HIGH-CARBON FATTY ACID-NONVOLATIL
LAURIC DIETHANOLAMIDE				0.00	0.00	HIGH-CARBON AMIDE - NONVOLATILE
MALATHION	156.5	.7	330.35	.00	.00	
MBTS (2-BENZOTHIAZOLYL SULFIDE)			332.47		0.00	CRYSTALLINE AT ROOM TEMP.
MENTHOL	216		156.27	.15	1.54	
METHOXYCHLOR				0.00	0.00	NONVOLATILE CRYSTAL AT ROOM TEMP
METHYL ALCOHOL	65		32.04	92.39	429.70	
METHYL ANTHRANILATE				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
METHYL P-HYDROXYBENZOATE	223.3		152.15	.07	.67	
METHYLBENZETHONIUM CHLORIDE				0.00	0.00	SALTS ASSUMED NONVOLATILE
METHYLENE CHLORIDE	41		84.93	365.66	2768.98	
MGK	307		204.27	.00	.01	MGK 11 USED AS TYPICAL COMPOUND
MICROCRYSTALLINE WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
MILLED PALE CREPE				0.00	0.00	SOLID AT AMBIENT TEMPERATURE
MILLED SMOKE RUBBER				0.00	0.00	SOLID AT AMBIENT TEMPERATURE
MINERAL OIL				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
MINERAL SPIRITS			50.00	50.00	290.51	KNOWN TO BE VOLATILE
MIRANOL C2MSF				0.00	0.00	HIGH-CARBON SALT
MONAMID 716				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
MONOETHYLENE GLYCOL	198		62.10	.06	.39	
MONO ETHYL ETHER			90.10	3.80	29.64	

TABLE 2 (Continued)
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
MONOGLYCEROL P-AMINOBENZOATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
MONURON					0.00	PROBABLY AN OIL
MORPHOLINE	128		87.12	8.00	61.36	
MYRISTIC ACID	250.5	100	228.38	.00	.00	
MYRISTIL ALCOHOL	263.2		214.40	.00	.01	
NAPHTHALENE	217.9		128.16	.21	1.91	
NEOPRENE				0.00	0.00	LARGE POLYMER
NITROCELLULOSE				0.00	0.00	LARGE POLYMER
NITROPROPANE (1-,2-)			89.09	9.38	72.78	RER DERIVED FROM AVG RER'S
N-OCTYL-BICYCLOHEPTENE DICARBOXIMIDE					0.00	HIGH-CARBON CMPD - ASSUMED NONVOL
NONYLPHENOXY ACETIC ACID			50.00	50.00	290.51	HIGH CARBON SOLID
OILS				0.00	0.00	ASSUMED TO BE HIGH-C FATTY ACIDS
OLEIC ACID	360		282.46	0.00	0.00	NEAR SOLID AT AMBIENT TEMP.
OXYGENATED ORGANIC ACIDS			50.00	50.00	290.51	NO DATA - ASSUMED VOLATILE
PALMITIC ACID	350,267	100	256.43	0.00	0.00	HIGH-CARBON FATTY ACID-NONVOLATIL
PARAFFIN WAXES				0.00	0.00	WAXES ASSUMED NONVOLATILE
PENTANE			72.15	430.00	3001.23	
PERCHLOROETHYLENE	121.4		165.83	14.00	148.14	
PERFUME			50.00	50.00	290.51	
PERFUME IN ALCOHOL			50.00	50.00	290.51	
PERFUME OIL			50.00	50.00	290.51	
PETREX 7-75T (DRY)	136	11	234.30	.01	.07	USED 2-ACETYL BENZOFURAN
PETROLEUM AND SYNTHETIC WAXES				0.00	0.00	WAXES ARE NONVOLATILE
PETROLEUM DISTILLATE (NAPHTHA)			50.00	50.00	290.51	KNOWN TO BE VOLATILE
PETROLEUM ETHERS			90.10	3.80	29.64	SURROGATE = MONOETHYL ETHER
PETROLEUM OIL			50.00	50.00	290.51	ASSUMED VOLATILE
PETROLEUM SOLVENTS			50.00	50.00	290.51	KNOWN TO BE VOLATILE
PHENOLIC RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
PICLORAM					0.00	ASSUMED NONVOLATILE
PINE OIL	155		136.23	3.00	28.75	SURROGATE=PINENE
PIPERONYL BUTOXIDE	180	1	338.44	.00	.00	
PLASTIC				0.00	0.00	RESINS ASSUMED NONVOLATILE
PLASTICIZER (DGO-,3GH-)			312.36	0.00	0.00	SURROGATE=BUTYL BENZYL PHTHALATE
PLURONIC F 108 DETERGENT				0.00	0.00	DETERGENT NONVOLATILE
POLAWAX A 31				0.00	0.00	WAXES ASSUMED NONVOLATILE
POLY-BETA-PINENE RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
POLYACRYLATE				0.00	0.00	LARGE POLYMER
POLYACRYLIC ACID (40% AQ.) M.W.10				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYDIMETHYLSILOXANE					0.00	POLYMERS ASSUMED NONVOLATILE
POLYETHOXYLATED (75 EQ) LANOLIN				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYETHYLENE					0.00	POLYMERS ASSUMED NONVOLATILE
POLYETHYLENE GLYCOL (400) MONOLAU				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYISOBUTYLENE (TRI-,TETRAMER-)			196.38	.53	5.71	
POLYOXYETHYLENE (2) CETYL ETHER	270		466.89	.01	.14	
POLYOXYETHYLENE SORBITAN MONOSTEARATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
POLYQUATERNIUM 4				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYTRIMETHYLDIHYDRO-QUINOLINE				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYVINYL ACETATE				0.00	0.00	LARGE POLYMER
POTASSIUM SOAP OF OLEIC ACID				0.00	0.00	SOAPS ARE NONVOLATILE

TABLE 2 (Continued)
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
PRESERVATIVES				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
PROCETYL AWS				0.00	0.00	HIGH-CARBON ASSUMED NONVOLATILE
PROPANE	-42.1		44.11	8.50	46.39	
N-PROPYL ALCOHOL	97.8		60.09	15.41	98.17	
PROPYL P-HYDROXYBENZOATE					.10	NO DATA - ASSUMED VOLATILE
PROPYLENE GLYCOL	189		76.11	.10	.75	
PROPYLENE GLYCOL DIPELARGONATE	213	757	198.32	.08	.87	
PROPYLENE GLYCOL RICINOLEATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
PROTEIN HYDROLYSATE				0.00	0.00	ASSUMED NONVOLATILE
PVP-VA COPOLYMER E-735				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
PYRETHRIN I	170	.1	328.46	.00	.00	
PYRETHRIN II	200	.1	372.47	.00	.00	
QUATERNIUM 26				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
RESYN 28-2930				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
RHOPLEX B				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
ROSIN					0.00	USED ABIETIC ACID - SOLID
ROTENONE	215		394.00	.24	3.91	
SALICTLANILIDE				0.00	0.00	HIGH CARBON - ASSUMED NONVOLATILE
SALICTLIC ACID	211	20	138.12	.00	.00	
SANDOPAN DTC ACID					0.00	HIGH-CARBON SALT
SANDOPAN TFL CONCENTRATE				0.00	0.00	HIGH-CARBON SALT
SAPAMINE COB-ST				0.00	0.00	STEARIC ACID AMIDE
SAPAMINE WL				0.00	0.00	STEARIC ACID AMIDE
SESAME OIL				0.00	0.00	HIGH-CARBON FATTY ACID
SEVIN					0.00	HIGH-CARBON ASSUMED NONVOLATILE
SILICONE DEFOAMER					0.00	NO DATA - ASSUMED NONVOLATILE
SILICONE FLUID 220/350CS				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
SILICONE LE 452				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
SILICONE OIL 350 CS, 10000 CS				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
SINDAR TECHNICAL G4-40					0.00	NO DATA - ASSUMED NONVOLATILE
SOAP					0.00	SOAPS ARE NONVOLATILE
SODIUM DODECYLBENZENE SULFONATE				0.00	0.00	HIGH-CARBON SALT
SODIUM LAURYL SARCOSINATE				0.00	0.00	LONG-CHAIN ESTER
SODIUM LAURYL SULFATE				0.00	0.00	HIGH-CARBON CMPD - NONVOLATILE
SODIUM O-PHENYLPHENOLATE				0.00	0.00	SALT
SODIUM XYLENE SULFONATE				0.00	0.00	SALT
SOLVENTS			50.00	50.00	290.51	ASSUMED VOLATILE
SORBITAN MONOSTEARATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
SORBITOL	295	5	182.18	0.00	0.00	HIGH-CARBON SUGAR - NONVOLATILE
SPAN 80			428.61	0.00	0.00	NO DATA - ASSUMED NONVOLATILE
SPAN 85				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
STEARATE EMULSIFIER					0.00	LONG-CHAIN ESTER
STEARIC ACID	383		284.47	0.00	0.00	LONG-CHAIN FATTY ACID
STODDARD SOLVENT			50.00	50.00	290.51	KNOWN TO BE VOLATILE
STYRENATED ALKYD RESIN					0.00	RESINS ASSUMED NONVOLATILE
SUNSCREEN AGENT				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
SURFACTANT NF				0.00	0.00	ASSUMED NONVOLATILE
SURFACTANT WK				0.00	0.00	ASSUMED NONVOLATILE
SYM-DI-BETA-NAPTHYL-P-PHENYL DIAM					0.00	GREASES

TABLE 2 (Continued)
RELATIVE EVAPORATION RATES - ALPHABETICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
TALL OIL				0.00	0.00	RESINS ASSUMED NONVOLATILE
TARTARIC ACID			168.10	0.00	0.00	SOLID AT ROOM TEMP
TENSIOFIX (LX. WP)					0.00	NO DATA - ASSUMED NONVOLATILE
TERGITOL ANIONIC 4				0.00	0.00	NONVOLATILE SALT
TERGITOL MIN-FOAM				0.00	0.00	NONVOLATILE SALT
THICKENERS				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
THIURAM					0.00	CRYSTALLINE AT ROOM TEMP.
THYMOL	233.92	2	150.22	.01	.09	
TINOPAX ANA					0.00	NO DATA - PROBABLY A SOLID
TOLUENE	110.8		92.10	21.48	169.35	
TRIBASIC LEAD MALEATE					0.00	SALTS ASSUMED NONVOLATILE
TRIBUTOXYETHYL PHOSPHATE					0.00	SALT - ASSUMED NONVOLATILE
TRIBUTYL PHOSPHATE					0.00	SALT - ASSUMED NONVOLATILE
1,1,1-TRICHLOROETHANE	76		133.41	100.00	949.09	
TRICHLOROETHYLENE	87		131.29	66.08	622.12	
TRICRESYL PHOSPHATE			368.37	.50	7.89	UNION OIL DATA
TRIETHANOL AMINE OLEATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
TRIETHANOLAMINE	277	150	149.19	.00	.00	
TRIETHYLENE GLYCOL	287.4		150.20	-.00	.00	
TRITON X-200					0.00	NO DATA - ASSUMED NONVOLATILE
TURKEY RED OIL				0.00	0.00	FATTY ACID:NONVOLATILE
TURPENTINE	155	136.23	3.00	28.75	40.92	SURROGATE=PINENE
TWEEN 81					0.00	NO DATA - ASSUMED NONVOLATILE
UNDECYLENIC ACID				0.00	0.00	HIGH-CARBON FATTY ACID
UREA CARBAMIDE					0.00	NO DATA - ASSUMED NONVOLATILE
VEGETABLE OIL				0.00	0.00	ASSUMED NONVOLATILE
WEOREZ S-71					0.00	NO DATA - ASSUMED NONVOLATILE
WETTING AGENT					0.00	NO DATA - ASSUMED NONVOLATILE
WHITE SPIRIT OR NAPTHA			50.00	50.00	290.51	KNOWN TO BE VOLATILE
WOOD FLOUR					0.00	CELLULOSE AND LIGNITE-NONVOLATILE
XYLENE	144.4		106.17	5.00	42.33	
XYLOL	144.4		106.17	5.00	42.33	SAME AS XYLENE
ZINC DIMETHYL DITHIOCARBAMATE					0.00	NO DATA - ASSUMED NONVOLATILE
ZINC NAPHTHENATE					0.00	METALLIC SALT
ZINC UNDECYLENATE				0.00	0.00	SALTS ASSUMED NONVOLATILE

TABLE 3

RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
5-BENZYL-3-FURYL.....					0.00	NO DATA - ASSUMED NONVOLATILE
AC POLYETHYLENE 629				0.00	0.00	LARGE POLYMER
ACRYLIC RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
ACRYSOL LEVELING AID					0.00	NO DATA - ASSUMED NONVOLATILE
ADIPIC ACID					0.00	HIGH-C FATTY ACIDS NONVOLATILE
ALCOHOL-SOLUBLE LANOLIN				0.00	0.00	HIGH-C FATTY CMPDS NONVOLATILE
ALKYD RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
ALKYL ARYL SODIUM SULFONATE				0.00	0.00	SALT
ALKYLDIMETHYLBENZYLAMMONIUM					0.00	NO DATA - ASSUMED NONVOLATILE
ALKYLDIMETHYLBENZYLAMMONIUM CHLORIDE					0.00	SALTS ASSUMED NONVOLATILE
ALLETHRIN, D-TRANS	302.41				0.00	HIGH-CARBON ESTER-NONVOLATILE
ALUMINUM PHENYLSULFONATE				0.00	0.00	SALTS ASSUMED NONVOLATILE
AMMONIUM CITRATE				0.00	0.00	SALT ASSUMED NONVOLATILE
AMMONIUM LAURYL ETHER SULPHATE				0.00	0.00	HIGH-CARBON SALT
AMMONIUM OXALATE			142.11	0.00	0.00	NONVOLATILE SALT
AMMONYX 4002				0.00	0.00	VERY HIGH-CARBON COMPOUND
AMPHOMER				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
ANTARON FC-34				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
BAYGON			209.24		0.00	CRYSTALLINE-ASSUMED NONVOLATILE
BEESWAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
BENZETHONIUM				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
BIOCIDE					0.00	NO DATA - ASSUMED NONVOLATILE
BUTADIENE-STYRENE COPOLYMER				0.00	0.00	LARGE POLYMER NONVOLATILE
CALCIUM THIOGLYCOLATE TRIHYDRATE				0.00	0.00	SALTS ASSUMED NONVOLATILE
CALGON					0.00	NO DATA - ASSUMED NONVOLATILE
CARBARYL				0.00	0.00	NONVOLATILE CRYSTAL AT ROOM TEMP
CARBOPOL 934				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
CARBOXYMETHYL CELLULOSE				0.00	0.00	LARGE POLYMER
CARNAUBA WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
CARTARETINE F4					0.00	NO DATA - ASSUMED NONVOLATILE
CATIONIC CELLULOSE				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
CELLULOSE ACETATE BUTYRATE				0.00	0.00	LARGE POLYMER
CERESIN					0.00	NO DATA - ASSUMED NONVOLATILE
CETYL ALCOHOL, FLAKES	190.00	15.00		0.00	0.00	HIGH-CARBON ALCOHOL - NONVOLATILE
CHLOR. PARAFFIN PLASTICIZER					0.00	SURROGATE=BUTYL BENZYL PHTHALATE
CHLORDANE			409.78		0.00	FROM STRUCTURE, PROBABLY NON-VOL
CHLOROSULFONATED POLYETHYLENE					0.00	POLYMERS ASSUMED NONVOLATILE
CITRIC ACID	DECOMPOSES		192.12	0.00	0.00	ASSUMED NONVOLATILE
COCAMINO BETAINE				0.00	0.00	LONG-CHAIN POLYMER
COCONUT AMIDOPROPYL- 3-DIMETHYLAMINE BETAINE				0.00	0.00	LONG-CHAIN POLYMER
COCONUT OIL AMINE				0.00	0.00	HIGH-CARBON
COLOR				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
COLOR MIX					0.00	NO DATA - ASSUMED NONVOLATILE
CONDANOL (DBS,DLS,MLS,SB/L)				0.00	0.00	NONVOLATILE SALT
COPPER UNDECYLENATE				0.00	0.00	HIGH-CARBON SALT - NONVOLATILE
CROMEEN				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
CRYSTALLINE WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
CUBE RESINS				0.00	0.00	RESINS ASSUMED NONVOLATILE

TABLE 3 (Continued)
RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
CYCLOPROPANE CARBOXYLATE					0.00	USED CYPOTHRIN (HIGH-CARBON)
DC 193 FLUID				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
DEHYDROGENATED RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
DETERGENT				0.00	0.00	SURROGATE=SODIUM LAURYL SULFATE
DIMETHYCONE COPOLYOL				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
DITHIO-BIS-STEARYL PROPIONATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
DODECYL BENZENE SULFONATE				0.00	0.00	HIGH-CARBON ESTER
DOW 276-V9					0.00	NO DATA - ASSUMED NONVOLATILE
DRIERS				0.00	0.00	ASSUMED TO REMAIN IN THE COATINGS
DUREZ (14000,16470,22008)				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
DUREZ (19788,12686,12687)				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
DUREZ (26141,26789,26799)				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
DUREZ 7421A				0.00	0.00	PHENOL-FORMALDEHYDE RESIN
EDTA					0.00	NO DATA - ASSUMED NONVOLATILE
ELASTOMERIC BINDER					0.00	POLYMERS ASSUMED NONVOLATILE
EMOLLIENT				0.00	0.00	PROBABLY NONVOLATILE
EMULPHOR ON-870					0.00	NO DATA - ASSUMED NONVOLATILE
EMULSIFIERS, HUMECTANTS, WAXES				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
ENDOSULPHAN					0.00	NO DATA - ASSUMED NONVOLATILE
ESSENTIAL CEDAR OIL					0.00	NO DATA - ASSUMED NONVOLATILE
ETHOXYLATE TRIDECYL ALCOHOL				0.00	0.00	LONG-CHAIN ALCOHOL
ETHOXYLATED FATTY ALCOHOL SULFATE				0.00	0.00	HIGH-CARBON ASSUME NONVOLATILE
ETHYLENE GLYCOL DISTEARATE				0.00	0.00	LONG-CHAIN ESTER
2-ETHYL HEXYL SALICYLATE				0.00	0.00	HIGH-CARBON ACID - NONVOLATILE
FATTY ACID AMIDES				0.00	0.00	SURROGATE=NYLON; ASSUMED NONVOLAT
FATTY ACID SOAP				0.00	0.00	SOAPS ASSUMED NONVOLATILE
FISH OIL				0.00	0.00	ASSUMED NONVOLATILE
FLUILAN				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
FOAM STABILIZERS					0.00	NO DATA - ASSUMED NONVOLATILE
FOLPET	296.56				0.00	CRYSTALLINE-ASSUMED NONVOLATILE
FRACTAL A					0.00	NO DATA - ASSUMED NONVOLATILE
GANTREZ ES 225 OR ES 425				0.00	0.00	PROBABLY A RESIN - NONVOLATILE
GELVA (TS 22,23,30,31,85)					0.00	POLYVINYL ACETATE RESIN
HARD WAXES				0.00	0.00	WAXES ASSUMED NONVOLATILE
HOECHST WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
HUMECTANTS				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
HYDROGENATED RESIN ESTER				0.00	0.00	RESINS ASSUMED NONVOLATILE
HYDROXYALKYL CELLULOSE (KLUCEL HA				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
ISOPROPYL MYRISTATE	192.60	20.00	270.46	0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
O-ISOPROXYPHENYL METHYLCARBAMATE				0.00	0.00	C11 COMPOUND ASSUMED NONVOLATILE
KELTHANE	370.49				0.00	CRYSTALLINE-ASSUMED NONVOLATILE
KELZAN				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
KOSOL				0.00	0.00	STARCH (POWDER)
KP-140					0.00	NO DATA - ASSUMED NONVOLATILE
LANETO 100				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
LANOLIN				0.00	0.00	ASSUMED NONVOLATILE
LATEX POLYMER ACRYLIC RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
LAURIC ACID	131.00	1.00	200.33	0.00	0.00	HIGH-CARBON FATTY ACID-NONVOLATIL
LAURIC DIETHANOLAMIDE				0.00	0.00	HIGH-CARBON AMIDE - NONVOLATILE

TABLE 3 (Continued)
RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
MBTS (2-BENZOTHIAZOLYL SULFIDE)			332.47		0.00	CRYSTALLINE AT ROOM TEMP.
METHOXYCHLOR				0.00	0.00	NONVOLATILE CRYSTAL AT ROOM TEMP
METHYL ANTHRANILATE				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
METHYLBENZETHONIUM CHLORIDE				0.00	0.00	SALTS ASSUMED NONVOLATILE
MICROCRYSTALLINE WAX				0.00	0.00	WAXES ASSUMED NONVOLATILE
MILLED PALE CREPE				0.00	0.00	SOLID AT AMBIENT TEMPERATURE
MILLED SMOKE RUBBER				0.00	0.00	SOLID AT AMBIENT TEMPERATURE
MINERAL OIL				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
MIRANOL C2MSF				0.00	0.00	HIGH-CARBON SALT
MONAMID 716				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
MONOGLYCEROL P-AMINOBENZOATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
NEOPRENE				0.00	0.00	LARGE POLYMER
NITROCELLULOSE				0.00	0.00	LARGE POLYMER
N-OCTYL-BICYCLOHEPTENE DICARBOXIMIDE					0.00	HIGH-CARBON CMPD - ASSUMED NONVOL
OILS				0.00	0.00	ASSUMED TO BE HIGH-C FATTY ACIDS
OLEIC ACID	360.00		282.46	0.00	0.00	NEAR SOLID AT AMBIENT TEMP.
PALMITIC ACID	350,267	100.00	256.43	0.00	0.00	HIGH-CARBON FATTY ACID-NONVOLATIL
PARAFFIN WAXES				0.00	0.00	WAXES ASSUMED NONVOLATILE
PETROLEUM AND SYNTHETIC WAXES				0.00	0.00	WAXES ARE NONVOLATILE
PHENOLIC RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
PLASTIC				0.00	0.00	RESINS ASSUMED NONVOLATILE
PLASTICIZER (DGO-,3GH-)			312.36	0.00	0.00	SURROGATE=BUTYL BENZYL PHTHALATE
PLURONIC F 108 DETERGENT				0.00	0.00	DETERGENT NONVOLATILE
POLAWAX A 31				0.00	0.00	WAXES ASSUMED NONVOLATILE
POLY-BETA-PINENE RESIN				0.00	0.00	RESINS ASSUMED NONVOLATILE
POLYACRYLATE				0.00	0.00	LARGE POLYMER
POLYACRYLIC ACID (40% AQ.) M.W.10				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYDIMETHYLSILOXANE					0.00	POLYMERS ASSUMED NONVOLATILE
POLYETHOXYLATED (75 EQ) LANOLIN				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYETHYLENE					0.00	POLYMERS ASSUMED NONVOLATILE
POLYETHYLENE GLYCOL (400) MONOLAU				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYOXYETHYLENE SORBITAN MONOSTEARATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
POLYQUATERNIUM 4				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYTRIMETHYLDIHYDRO-QUINOLINE				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
POLYVINYL ACETATE				0.00	0.00	LARGE POLYMER
POTASSIUM SOAP OF OLEIC ACID				0.00	0.00	SOAPS ARE NONVOLATILE
PRESERVATIVES				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
PROCETYL AWS				0.00	0.00	HIGH-CARBON ASSUMED NONVOLATILE
PROPYLENE GLYCOL RICINOLEATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
PROTEIN HYDROLYSATE				0.00	0.00	ASSUMED NONVOLATILE
PVP-VA COPOLYMER E-735				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
QUATERNIUM 26				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
RESYN 28-2930				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
RHOPLEX B				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
ROSIN					0.00	USED ABIETIC ACID - SOLID
SALICYLANILIDE				0.00	0.00	HIGH CARBON - ASSUMED NONVOLATILE
SANDOPAN DTC ACID					0.00	HIGH-CARBON SALT
SANDOPAN TFL CONCENTRATE				0.00	0.00	HIGH-CARBON SALT
SAPAMINE COB-ST				0.00	0.00	STEARIC ACID AMIDE

TABLE 3 (Continued)

RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
SAPAMINE WL				0.00	0.00	STEARIC ACID AMIDE
SESAME OIL				0.00	0.00	HIGH-CARBON FATTY ACID
SEVIN					0.00	HIGH-CARBON ASSUMED NONVOLATILE
SILICONE DEFOAMER					0.00	NO DATA - ASSUMED NONVOLATILE
SILICONE FLUID 220/350CS				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
SILICONE LE 452				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
SILICONE OIL 350 CS, 10000 CS				0.00	0.00	POLYMERS ASSUMED NONVOLATILE
SINDAR TECHNICAL G4-40					0.00	NO DATA - ASSUMED NONVOLATILE
SOAP					0.00	SOAPS ARE NONVOLATILE
SODIUM DODECYLBENZENE SULFONATE				0.00	0.00	HIGH-CARBON SALT
SODIUM LAURYL SARCOSINATE				0.00	0.00	LONG-CHAIN ESTER
SODIUM LAURYL SULFATE				0.00	0.00	HIGH-CARBON CMPD - NONVOLATILE
SODIUM O-PHENYLPHENOLATE				0.00	0.00	SALT
SODIUM XYLENE SULFONATE				0.00	0.00	SALT
SORBITAN MONOSTEARATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
SORBITOL	295.00	5.00	182.18	0.00	0.00	HIGH-CARBON SUGAR - NONVOLATILE
SPAN 80			428.61	0.00	0.00	NO DATA - ASSUMED NONVOLATILE
SPAN 85				0.00	0.00	NO DATA - ASSUMED NONVOLATILE
STEARATE EMULSIFIER					0.00	LONG-CHAIN ESTER
STEARIC ACID	383.00		284.47	0.00	0.00	LONG-CHAIN FATTY ACID
STYRENATED ALKYD RESIN					0.00	RESINS ASSUMED NONVOLATILE
SUNSCREEN AGENT				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
SURFACTANT NF				0.00	0.00	ASSUMED NONVOLATILE
SURFACTANT WK				0.00	0.00	ASSUMED NONVOLATILE
SYM-DI-BETA-NAPTHYL-P-PHENYL DIAM					0.00	GREASES
TALL OIL				0.00	0.00	RESINS ASSUMED NONVOLATILE
TARTARIC ACID			168.10	0.00	0.00	SOLID AT ROOM TEMP
TENSIOFIX (LX, WP)					0.00	NO DATA - ASSUMED NONVOLATILE
TERGITOL ANIONIC 4				0.00	0.00	NONVOLATILE SALT
TERGITOL MIN-FOAM				0.00	0.00	NONVOLATILE SALT
THICKENERS				0.00	0.00	FUNCTION IMPLIES NONVOLATILITY
THIURAM					0.00	CRYSTALLINE AT ROOM TEMP.
TINOPAX ANA					0.00	NO DATA - PROBABLY A SOLID
TRIBASIC LEAD MALEATE					0.00	SALTS ASSUMED NONVOLATILE
TRIBUTOXYETHYL PHOSPHATE					0.00	SALT - ASSUMED NONVOLATILE
TRIBUTYL PHOSPHATE					0.00	SALT - ASSUMED NONVOLATILE
TRIETHANOL AMINE OLEATE				0.00	0.00	HIGH-CARBON ESTER - NONVOLATILE
TRITON X-200					0.00	NO DATA - ASSUMED NONVOLATILE
TURKEY RED OIL				0.00	0.00	FATTY ACID:NONVOLATILE
TWEEN 81					0.00	NO DATA - ASSUMED NONVOLATILE
UNDECYLENIC ACID				0.00	0.00	HIGH-CARBON FATTY ACID
UREA CARBAMIDE					0.00	NO DATA - ASSUMED NONVOLATILE
VEGETABLE OIL				0.00	0.00	ASSUMED NONVOLATILE
WEOREZ S-71					0.00	NO DATA - ASSUMED NONVOLATILE
WETTING AGENT					0.00	NO DATA - ASSUMED NONVOLATILE
WOOD FLOUR					0.00	CELLULOSE AND LIGNITE-NONVOLATILE
ZINC DIMETHYL DITHIOCARBAMATE					0.00	NO DATA - ASSUMED NONVOLATILE
ZINC UNDECYLENATE				0.00	0.00	SALTS ASSUMED NONVOLATILE
PYRETHRIN I	170.00	.10	328.46	.00	.00	

TABLE 3 (Continued)
RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
PYRETHRIN II	200.00	.10	372.47	.00	.00	
PIPERONYL BUTOXIDE	180.00	1.00	338.44	.00	.00	
MALATHION	156.50	.70	330.35	.00	.00	
DIOCTYL PHTHALATE PLASTICIZER	385.00		390.56	.00	.00	
MYRISTIC ACID	250.50	100.00	228.38	.00	.00	
SALICYLIC ACID	211.00	20.00	138.12	.00	.00	
TRIETHANOLAMINE	277.00	150.00	149.19	.00	.00	
0-BENZYL-P-CHLOROPHENOL	161.00	3.50	218.68	.00	.00	
GLYCEROL	DECOMPOSES @ 290		92.11	.00	.00	
DIBUTYL PHTHALATE	340.00		278.35	.00	.00	
TRIETHYLENE GLYCOL	287.40		150.20	.00	.00	
BENZYL BENZOATE	323.50		212.25	.00	.00	
AMPD	151.20	10.00	105.14	.00	.00	
2,4 BIS (ISOPROPYLAMINO)-6 METHOXY-S-TRIAZINE					0.00	
4-AMINO-3,5,6-TRICHLOROPICOLINIC ACID					0.00	ASSUMED NONVOLATILE
2,4,5-TRICHLOROPHENOXYACETIC ACID, POTASSIUM SALT					0.00	SALT-ASSUMED NONVOLATILE
C1.S.P. COMPOUNDS					0.00	NO DATA - ASSUMED NONVOLATILE
COPPER NAPHTHENATE					0.00	METALLIC SALT
BROMOCIL					0.00	SOLID - ASSUMED NONVOLATILE
GRANULAR MINERAL BASE					0.00	SOLID - ASSUMED NONVOLATILE
ISOOCTYL ESTERS					0.00	FAIRLY HIGH CARBON ESTER
ISOBUTYLENE POLYMERS					0.00	POLYMER - ASSUMED NONVOLATILE
MONURON					0.00	PROBABLY AN OIL
PICLORAM					0.00	ASSUMED NONVOLATILE
ZINC NAPHTHENATE					0.00	METALLIC SALT
2-FURALDEHYDE, 2,3:4,5-BIS-(2-BUTYLENE) TETRAHYDRO	307.00		204.27	0.00	.01	
MYRISTIL ALCOHOL	263.20		214.40	.00	.01	
MGK	307.00		204.27	.00	.01	MGK 11 USED AS TYPICAL COMPOUND
2-ETHYL-1,3-HEXANEDIOL	244.00		146.23	.00	.02	
N,N-DIALKYL-M-TOLUAMIDE	160.00	19.00	191.27	.00	.02	USED N,N-DIETHYL-M-TOLUAMIDE
DIETHYLENE GLYCOL	245.00		106.12	.00	.02	
BENZOIC ACID	249,133	10.00	122.13	.00	.03	
PETREX 7-75T (DRY)	136.00	11.00	234.30	.01	.07	USED 2-ACETYL BENZOFURAN
ALKYL DIETHANOLAMINE			88.13	.01	.07	USED ETHYL DIETHANOLAMINE
THYMOL	233,92	2.00	150.22	.01	.09	
DIPROPYLENE GLYCOL	292/232		134.20	.01	.10	RER SHOULD BE < 0.1
PROPYL P-HYDROXYBENZOATE					.10	NO DATA - ASSUMED VOLATILE
DDVP	140.00	20.00	220.98	.01	.11	
POLYOXYETHYLENE (2) CETYL ETHER	270.00		466.89	.01	.14	
MONOETHYLENE GLYCOL	198.00		62.10	.06	.39	
ETHYLENE GLYCOL	198.00		62.10	.06	.39	
METHYL P-HYDROXYBENZOATE	223.30		152.15	.07	.67	
PROPYLENE GLYCOL	189.00		76.11	.10	.75	
PROPYLENE GLYCOL DIPELARGONATE	213.00	757.00	198.32	.08	.87	
CRESOL (O-,M-,P-)			108.13	.11	.96	RER DERIVED FROM AVG RER'S
MENTHOL	216.00		156.27	.15	1.54	

TABLE 3 (Continued)
RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
NAPHTHALENE	217.90		128.16	.21	1.91	
CARBITOL	202.00		134.20	.21	1.99	
2-AMINO-2-METHYL PROPANOL	165.50		89.14	.33	2.53	
ETHANOLAMINE	172.00		61.08	.40	2.57	
L-CAMPHOR	SUBLIMES @		152.24	.28	2.81	
D.L-CAMPHOR	SUBLIMES		152.24	.28	2.81	
D-CAMPHOR	SUBLIMES @		152.24	.28	2.81	
AMP	.165.00		89.14	.44	3.41	
ROTENONE	215.00		394.00	.24	3.91	
DIPROPYLENE GLYCOL MONOMETHYL ETH	187.20		162.23	.46	4.76	
BUTYL CELLOSOLVE	170.00		118.17	.60	5.36	E.G. MONOBUTYL ETHER
ETHYLENE GLYCOL MONOBUTYL ETHER			118.17	.60	5.36	
POLYISOBUTYLENE (TRI-,TETRAMER-)			196.38	.53	5.71	
TRICRESYL PHOSPHATE			368.37	.50	7.89	UNION OIL DATA
O-DICHLOROBENZENE	180.50		147.00	.89	8.89	
CELLOSOLVE ACETATE	156.00		132.16	1.20	11.34	
DIETHYLENE GLYCOL MONOMETHYL ETHE	159.00		120.15	1.88	16.96	
AMYL ACETATE	148.00	737.00	130.20	3.05	28.55	USED N-AMYLACETATE
PINE OIL	155.00		136.23	3.00	28.75	SURROGATE=PINENE
PETROLEUM ETHERS			90.10	3.80	29.64	SURROGATE = MONOETHYL ETHER
MONO ETHYL ETHER			90.10	3.80	29.64	
ETHYLENE GLYCOL MONOETHYL ETHER	135.00		90.10	3.80	29.64	
GLYCOL ETHER			90.10	3.80	29.64	SURROGATE=E.G. MONOETHYL ETHER
TURPENTINE	155.00	136.23	3.00	28.75	40.92	SURROGATE=PINENE
XYLENE	144.40		106.17	5.00	42.33	
XYLOL	144.40		106.17	5.00	42.33	SAME AS XYLENE
PROPANE	-42.10		44.11	8.50	46.39	
MORPHOLINE	128.00		87.12	8.00	61.36	
ACETIC ACID	118.10		60.05	10.63	67.68	
NITROPROPANE (1-,2-)			89.09	9.38	72.78	RER DERIVED FROM AVG RER'S
CHLOR-AROMATIC SOLVENTS			112.56	8.80	76.72	SURROGATE=MONOCHLOROBENZENE
N-PROPYL ALCOHOL	97.80		60.09	15.41	98.17	
DICHLOROPENTANE			141.04	14.02	136.81	RER DERIVED FROM AVG RER'S
PERCHLOROETHYLENE	121.40		165.83	14.00	148.14	
TOLUENE	110.80		92.10	21.48	169.35	
AROMATIC HYDROCARBONS			92.10	22.00	173.49	SURROGATE = XYLENE
AROMATIC KETONE SOLVENT			92.10	22.00	173.49	SURROGATE = XYLENE
ISOPROPANOL	82.40		60.10	34.82	221.79	
ISOPROPYL ALCOHOL	82.40		60.10	34.82	221.79	
ETHANOL	78.50		46.07	43.90	244.84	
ETHYL ALCOHOL	78.40		46.07	43.90	244.84	
ETHYL ALCOHOL OP	78.40		46.07	43.90	244.84	SAME AS ETHANOL
ALCOHOL 740 P			50.00	50.00	290.51	
CHLORINATED SOLVENTS			50.00	50.00	290.51	
DEODORANT			50.00	50.00	290.51	
ESSENTIAL OIL			50.00	50.00	290.51	
ESTERS AND KETONES (ACETONE)			50.00	50.00	290.51	
FRAGRANCE			50.00	50.00	290.51	NO DATA - ASSUMED VOLATILE
FRAGRANCE, DYE			50.00	50.00	290.51	

TABLE 3 (Continued)
RELATIVE EVAPORATION RATES - NUMERICAL

PRODUCT NAME	BP (C)	PRESSURE	MW	VP	RER	COMMENTS
HALOGENATED HYDROCARBON PROPELLAN			50.00	50.00	290.51	
KEROSENE			50.00	50.00	290.51	KNOWN TO BE VOLATILE
MINERAL SPIRITS			50.00	50.00	290.51	KNOWN TO BE VOLATILE
PERFUME			50.00	50.00	290.51	
PERFUME IN ALCOHOL			50.00	50.00	290.51	
PERFUME OIL			50.00	50.00	290.51	
PETROLEUM DISTILLATE (NAPHTHA)			50.00	50.00	290.51	KNOWN TO BE VOLATILE
PETROLEUM OIL			50.00	50.00	290.51	ASSUMED VOLATILE
PETROLEUM SOLVENTS			50.00	50.00	290.51	KNOWN TO BE VOLATILE
SOLVENTS			50.00	50.00	290.51	ASSUMED VOLATILE
STODDARD SOLVENT			50.00	50.00	290.51	KNOWN TO BE VOLATILE
WHITE SPIRIT OR NAPTHA			50.00	50.00	290.51	KNOWN TO BE VOLATILE
N-ACETYLETHANOLAMINE			50.00	50.00	290.51	
NONYLPHENOXY ACETIC ACID			50.00	50.00	290.51	HIGH CARBON SOLID
OXYGENATED ORGANIC ACIDS			50.00	50.00	290.51	NO DATA - ASSUMED VOLATILE
ALIPHATIC HYDROCARBONS			86.17	50.00	381.38	USED HEXANE AS REPRESENTATIVE
ALIPHATIC THINNER			86.17	50.00	381.38	USED HEXANE AS REPRESENTATIVE
METHYL ALCOHOL	65.00		32.04	92.39	429.70	
ETHYLENE DICHLORIDE	83.50		99.00	61.00	498.72	
TRICHLOROETHYLENE	87.00		131.29	66.08	622.12	
ACETONE	56.20		58.08	132.49	829.65	
1,1,1-TRICHLOROETHANE	76.00		133.41	100.00	949.09	
ISOPARAFFINIC SOLVENT	60.30		86.18	168.34	1284.09	SURROGATE = ISOHEXANE
AMINES			73.14	200.00	1405.47	SURROGATE=DIETHYLAMINE
INERT INGREDIENTS (PESTICIDES)					1511.56	RER=WTD AVG OF TYPICAL INGRED.(2)
DICHLOROMETHANE	41.00		84.93	349.00	2642.83	SAME AS METHYLENE CHLORIDE
METHYLENE CHLORIDE	41.00		84.93	365.66	2768.98	
PENTANE			72.15	430.00	3001.23	
DIMETHYLENE OXIDE			44.05	1095.00	5971.73	
HYDROCARBON PROPELLANT			58.12	1544.67	9676.33	SURROGATE=BUTANE
BUTANE	-.10		58.12	1544.67	9676.33	
ISOBUTANE	-.50		58.12	1566.19	9811.14	
FORMALDEHYDE	-20.00		30.00	3243.38	14597.26	
FORMALIN	-20.00		30.00	3243.38	14597.28	
DIMETHYL ETHER	-25.00		46.70	3581.69	20112.19	

Table 4
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT VOC		FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
AEROSOL/NON-AEROSOL PRODUCTS (1)													
INSECT SPRAY PRODUCTS													
INSECT SPRAYS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,8			192.5	.11	1.00	.05	1.00	0.00	1.00	529.38	10587.50	0.00	10587.50
INSECT REPELLENTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,5			12.00	.11	1.00	.35	.85	.35	.85	230.34	561.00	230.34	561.00
MOTH CONTROL PRODUCTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			39.00	.11	1.00	.96	1.00	.96	1.00	2059.20	2136.42	2059.20	2136.42
ANIMAL INSECTICIDES (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 3,4			6.00	.11	1.00	.55	1.00	.55	1.00	181.50	329.01	181.50	329.01
SUB-TOTAL										3000.41	13613.93	2471.04	13613.93
PAINTS AND FINISHES													
PAINTS, PRIMERS, VARNISHES													
FORMULATIONS 5,6	300.60	.75		.11	1.15	.73	.87			10423.85	12391.69		
FORMULATIONS 3,6	300.60	.75		.11	1.15			.67	.87			9554.01	12391.69
OTHER RELATED PRODUCTS													
FORMULATIONS 1	6.9	.69		.11	1.00	.65	.65	.65	.65	170.21	170.21	170.21	170.21
SUB-TOTAL										10594.06	12561.90	9724.21	12561.90
HOUSEHOLD PRODUCTS													
ROOM DEODORANTS AND DISINFECTANTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,4	265.50	.50		.11	.94	.35	1.00			2436.43	6863.17		
FORMULATIONS 1,4	265.50	.50		.11	.94			.35	.87			2436.43	5970.96

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRI BUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTI- PLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
CLEANERS													
TILE AND BATHROOM CLEANERS													
FORMULATIONS 1,2,3,4,5 (2)			65.00	.11	1.00	0.00	.33			0.00	1179.75		
FORMULATIONS 2,3,4,5 (2)			65.00	.11	1.00			0.00	.33			0.00	1179.75
OVEN CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 3,4			33.00	.11	1.02	0.00	.20	0.00	.20	0.00	370.26	0.00	370.26
RUG AND UPHOLSTERY CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,3			115.00	.11	1.00	.03	.26	.03	.26	215.05	1644.50	215.05	1644.50
ALL PURPOSE CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			512.00	.11	1.07	.02	.41	.02	.41	602.62	12323.66	602.62	12323.66
WINDOW AND GLASS CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 6,7			174.00	.11	.98	0.00	.42	0.00	.42	0.00	3939.01	0.00	3939.01
LAUNDRY PRODUCTS-AEROSOLS													
STARCH, FABRIC FINISH													
FORMULATIONS 1,2	109.90	.75		.11	1.00	.05	.11	.05	.11	222.14	507.74	222.14	507.74
LAUNDRY PRODUCTS (AEROSOL AND NON-AEROSOL)													
PREWASH STAIN REMOVERS													
FORMULATIONS 1,2			84.00	.11	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPOT REMOVERS													
FORMULATIONS 1,2			2.30	.11	1.00	1.00	1.00	.90	1.00	126.50	126.50	113.85	126.50
WAXES AND POLISHES													
FORMULATIONS 1,3			58.00	.11	.95	.07	.34	.07	.34	212.14	1030.37	212.14	1030.37
ALL OTHER HOUSEHOLD SPRAY PRODUCTS													
FORMULATIONS	45.2	.75		.11	1.00					NA (4)	NA	NA	NA

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
SHOE POLISHES, WAXES AND COLORANTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			6.00	.11	1.00	.13	.98	.13	.98	42.90	323.40	42.90	323.40
ANTISTATIC SPRAYS													
FORMULATIONS 1,2			3.00	.11	1.00	0.00	.03	0.00	.03	0.00	4.95	0.00	4.95
ADHESIVES (5) (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,3,6 (2)			3277.50	.11	1.00	0.00	.85	0.00	.85	0.00	153223.12	0.00	153223.12
CAULKING AND SEALING CPDS (5) (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			432.80	.11	1.00	0.00	.20	0.00	.20	0.00	4760.80	0.00	4760.80
CARPET DEODORIZERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1			65.00	.11	.96	.02	.02	.02	.02	68.64	68.64	68.64	68.64
DRAIN OPENERS (AEROSOL AND NON-AEROSOL)													
LIQUIDS													
FORMULATIONS 2 (NO VOC)			17 (MIL.GAL.)	.11	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOLIDS													
FORMULATIONS 1			293.00	.11	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUB-TOTAL										3926.41	186365.88	3913.76	185473.67
PERSONAL PRODUCTS													
SHAVING LATHERS													
FORMULATIONS 2,4	162.80	.50		.11	1.01	.03	.09	.03	.09	140.17	402.44	140.17	402.44
HAIR SPRAYS													
FORMULATIONS 1,4	270.70	.63		.11	.93	.88	.97			7685.11	8505.09		
FORMULATIONS 4,5	270.70	.63		.11	.93			.73	.97			6376.64	8505.09
STYLING MOUSSE													
FORMULATIONS 1	106.10	.38		.11	1.00	.24	.24	.24	.24	543.29	543.29	543.29	543.29

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
OTHER HAIR CARE PRODUCTS-SHAMPOO													
(AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2,3 (2)			644.60	.11	1.00	0.00	.01	0.00	.01	0.00	177.27	0.00	177.27
PHARMACEUTICALS													
FORMULATIONS 1,3	43.70	.25		.11	1.08	.70	.99			453.61	645.70		
FORMULATIONS 2,3	43.70	.25		.11	1.08			.70	.99			453.61	645.70
COLOGNES													
FORMULATIONS 1	44.00	.12		.11	1.00	1.00	1.00	1.00	1.00	302.50	302.50	302.50	302.50
PERFUMES													
FORMULATIONS 1	82.00	.03		.11	1.00	1.00	1.00	1.00	1.00	135.30	135.30	135.30	135.30
AFTERSHAVES													
FORMULATIONS 1	23.00	.25		.11	1.00	.65	.65	.65	.65	204.93	204.93	204.93	204.93
PERSONAL DEODORANTS AND ANTI-PERSPIRANTS													
FORMULATIONS 1,2	156.00	.25		.11	.86	.80	.95	.80	.95	1475.76	1752.46	1475.76	1752.46
OTHER PERSONAL CARE PRODUCTS													
SUNTAN LOTIONS (2)													
FORMULATIONS 1,4,5 (2)	15.1	.13		.11	1.16	0.00	.65	0.00	.65	0.00	81.41	0.00	81.41
DEPILATORIES													
FORMULATIONS 1,2	15.10	.13		.11	1.03	.10	.10	.10	.10	11.12	11.68	11.12	11.68
SUB-TOTAL										10951.80	12762.06	9643.32	12762.06
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ANIMAL PRODUCTS													
VETERINARIAN AND PET PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
---------										----	----	----	----
AUTOMOTIVE AND INDUSTRIAL PRODUCTS													
REFRIGERANTS										NA	NA	NA	NA
CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 4,7	14.70	.88		.11	1.00	0.00	1.00	0.00	1.00	0.00	707.44	0.00	707.44

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRI BUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTI-PLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
ENGINE DEGREASERS				.11	1.00	.89	1.00			1025.97	1150.19		
FORMULATIONS 1,2,3 (2)	23.90	.88						.75	1.00			862.64	1150.19
FORMULATIONS 3	23.90	.88		.11	1.00								
LUBRICANTS AND SILICONES				.11	1.00	0.00	1.00	0.00	1.00	0.00	1824.68	0.00	1824.68
FORMULATIONS 1,2	75.40	.44											
UNDERCOATINGS				.11	1.00	.25	.85	.25	.85	85.59	291.02	85.59	291.02
FORMULATIONS 1	8.30	.75											
BRAKE CLEANERS				.11	1.00	1.00	1.00	1.00	1.00	1031.69	1031.69	1031.69	1031.69
FORMULATIONS 1, 2, or 3	16.60	1.13											
TIRE SEALANTS AND INFLATORS				.11	1.00					NA	NA	NA	NA
FORMULATIONS	19.30	.69											
CARBURETOR AND CHOKE CLEANERS				.11	1.00	.28	1.00	.28	1.00	459.69	1641.75	459.69	1641.75
FORMULATIONS 2,3	39.80	.75											
ENGINE STARTING FLUIDS				.11	1.00	1.00	1.00	1.00	1.00	948.64	948.64	948.64	948.64
FORMULATIONS 1	30.80	.56											
WINDSHIELD DEICER (AEROSOL AND NON)				.11	1.00	.75	1.00	.75	1.00	429.00	572.00	429.00	572.00
FORMULATIONS 1,2	10.40	1.00								NA	NA	NA	NA
OTHER AUTO AND INDUSTRIAL PRODUCTS										3980.58	8167.40	3817.25	8167.40
SUB-TOTAL										-------	-------	-------	-------

MISCELLANEOUS PRODUCTS													
HERBICIDES AND FUNGICIDES			69.00	.11	1.00	0.00	.95	0.00	.95	0.00	3605.25	0.00	3605.25
FORMULATIONS 1,7										0.00	3605.25	0.00	3605.25
SUB-TOTAL										----	----	----	----

NON-AEROSOL PRODUCTS													

PERSONAL PRODUCTS										NA	NA	NA	NA
NAIL POLISHES										NA	NA	NA	NA
NAIL POLISH REMOVERS													

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT VOC		FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
PERSONAL DEODORANTS AND ANTI-PIRSPIRANTS										NA	NA	NA	NA
SHAVING LATHERS										NA	NA	NA	NA
PRE-SHAVE PREPARATIONS										NA	NA	NA	NA
AFTER-SHAVE LOTIONS & COLOGNES (LISTED UNDER AEROSOL)										NA	NA	NA	NA
PERFUMES (LISTED UNDER AEROSOL)										NA	NA	NA	NA
RUBBING COMPOUNDS (ALCOHOL)										NA	NA	NA	NA
FACE WASHES (LIKE ASTRINGENTS)										NA	NA	NA	NA
FACIAL CREAMS AND WASHES										NA	NA	NA	NA
HAND LOTIONS										NA	NA	NA	NA
SUN LOTIONS, CREAMS AND OILS (LISTED UNDER AEROSOL)										NA	NA	NA	NA
MOUTHWASHES										NA	NA	NA	NA
HAIR SPRAYS										NA	NA	NA	NA
HAIR SHAMPOOS, RINSES AND OTHER HAIR PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
---------										----	----	----	----
HOUSEHOLD PRODUCTS													
SHOE POLISHES										NA	NA	NA	NA
BALL POINT AND POROUS POINT PENS										NA	NA	NA	NA
ROOM DEODORANTS AND DISINFECTANTS										NA	NA	NA	NA
CLEANERS													
OVEN CLEANERS										NA	NA	NA	NA
RUG AND UPHOLTERY CLEANERS										NA	NA	NA	NA
WINDOW AND GLASS CLEANERS										NA	NA	NA	NA
FLOOR CLEANERS										NA	NA	NA	NA
TILE AND BATHROOM CLEANERS										NA	NA	NA	NA

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
WALL CLEANERS										NA	NA	NA	NA
WAXES AND POLISHES (LIQUIDS)													
FORMULATIONS 2,3			3.00	.11	1.00	.24	.94	.24	.94	39.60	155.10	39.60	155.10
FLOOR WAXES OR POLISHES													
FORMULATIONS 1,2,3 (2)			27.00	.11	1.04	.20	.20	.20	.20	308.88	308.88	308.88	308.88
RUG DEODORIZERS AND FRESHENERS										NA	NA	NA	NA
LAUNDRY SPOT REMOVERS										NA	NA	NA	NA
MOTH CONTROL PRODUCTS										NA	NA	NA	NA
METAL CLEANERS AND POLISHES													
FORMULATIONS 2,3,4,5,7 (2)			24.00	.11	1.00	0.00	1.00	0.00	1.00	0.00	1320.00	0.00	1320.00
HOUSEHOLD ADHESIVES										NA	NA	NA	NA
FURNITURE POLISHES AND WAXES										NA	NA	NA	NA
SUB-TOTAL										348.48	1783.98	348.48	1783.98
---------										------	-------	------	-------
AUTOMOTIVE													
AUTO ANTIFREEZES													
FORMULATIONS 1			22.30	.11	1.00	.95	.95	.95	.95	1165.17	1165.17	1165.17	1165.17
CAR POLISHES AND WAXES													
FORMULATIONS 1,2	189.10	1.00		.11	1.05	.42	.42	.42	.42	4619.38	4630.30	4619.38	4630.30
WINDSHIELD WASHER FLUID										NA	NA	NA	NA
SUB-TOTAL										5784.56	5795.48	5784.56	5795.48
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GARAGE PRODUCTS													
HOUSEHOLD GLUE AND BONDING AGENTS										NA	NA	NA	NA
HOUSEHOLD CAULKS AND SEALANTS										NA	NA	NA	NA
INSECTICIDES										NA	NA	NA	NA
HERBICIDES										NA	NA	NA	NA
FUNGICIDES										NA	NA	NA	NA
BARBECUE LIGHTER FLUIDS										NA	NA	NA	NA
AUTO WINDSHIELD WASHERS										NA	NA	NA	NA

Table 4 (Continued)
VOC AND PROC EMISSIONS IN CALIFORNIA

PRODUCT	MILLION UNITS DISTRI BUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTI-PLIER	WEIGHT VOC LOW	WEIGHT VOC HIGH	FRACTION PROC LOW	FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
										NA	NA	NA	NA
DEGREASERS										0.00	0.00	0.00	0.00
SUB-TOTAL										----	----	----	----
---------										38586.30	244655.88	35702.63	243763.66
TOTAL EMISSIONS										--------	---------	--------	---------

(1) Products in these sub-categories are aerosol unless it is indicated that aerosol and non-aerosol are combined.
(2) More than two listed formulations indicates that several product formulations had the same low or high weight percent.
(3) Suntan lotion use varies strongly with season. However, the total emission estimate is independent of seasonal flucuation.
(4) NA indicates that emissions could not be calculated because either product use or formulation data were not available.
(5) Includes industrial, commercial, and consumer products.

Table 5
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
AEROSOL/NON-AEROSOL PRODUCTS (1)													
INSECT SPRAY PRODUCTS													
INSECT SPRAYS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,8			192.5	.03	1.00	.05	1.00	0.00	1.00	149.19	2983.75	0.00	2983.75
INSECT REPELLENTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,5			12.00	.03	1.00	.35	.85	.35	.85	64.91	158.10	64.91	158.10
MOTH CONTROL PRODUCTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			39.00	.03	1.00	.96	1.00	.96	1.00	580.32	602.08	580.32	602.08
ANIMAL INSECTICIDES (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 3,4			6.00	.03	1.00	.55	1.00	.55	1.00	51.15	92.72	51.15	92.72
SUB-TOTAL										845.57	3836.65	696.38	3836.65
PAINTS AND FINISHES													
PAINTS, PRIMERS, VARNISHES													
FORMULATIONS 5,6	300.60	.75		.03	1.05	.73	.87			2682.18	3188.53		
FORMULATIONS 3,6	300.60	.75		.03	1.05			.67	.87			2458.36	3188.53
OTHER RELATED PRODUCTS													
FORMULATIONS 1	6.9	.69		.03	1.00	.65	.65	.65	.65	47.97	47.97	47.97	47.97
SUB-TOTAL										2730.15	3236.50	2506.33	3236.50
HOUSEHOLD PRODUCTS													
ROOM DEODORANTS AND DISINFECTANTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,4	265.50	.50		.03	.94	.35	1.00			686.63	1934.17		
FORMULATIONS 1,4	265.50	.50		.03	.94			.35	.87			686.63	1682.73

Table 5 (Continued)
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
CLEANERS													
TILE AND BATHROOM CLEANERS													
FORMULATIONS 1,2,3,4,5 (2)			65.00	.03	1.00	0.00	.33			0.00	332.48		
FORMULATIONS 2,3,4,5 (2)			65.00	.03	1.00			0.00	.33			0.00	332.48
OVEN CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 3,4			33.00	.03	1.00	0.00	.20	0.00	.20	0.00	102.30	0.00	102.30
RUG AND UPHOLSTERY CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,3			115.00	.03	1.00	.03	.26	.03	.26	60.61	463.45	60.61	463.45
ALL PURPOSE CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			512.00	.03	1.00	.02	.41	.02	.41	158.72	3245.82	158.72	3245.82
WINDOW AND GLASS CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 6,7			174.00	.03	1.00	0.00	.42	0.00	.42	0.00	1132.74	0.00	1132.74
LAUNDRY PRODUCTS-AEROSOLS													
STARCH, FABRIC FINISH													
FORMULATIONS 1,2	109.90	.75		.03	1.00	.05	.11	.05	.11	62.60	143.09	62.60	143.09
LAUNDRY PRODUCTS (AEROSOL AND NON-AEROSOL)													
PREWASH STAIN REMOVERS													
FORMULATIONS 1,2			84.00	.03	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPOT REMOVERS													
FORMULATIONS 1,2			2.30	.03	1.00	1.00	1.00	.90	1.00	35.65	35.65	32.09	35.65
WAXES AND POLISHES													
FORMULATIONS 1,3			58.00	.03	1.00	.07	.34	.07	.34	62.93	305.66	62.93	305.66
ALL OTHER HOUSEHOLD SPRAY PRODUCTS													
FORMULATIONS	45.2	.75		.03	1.00					NA (4)	NA	NA	NA

Table 5 (Continued)
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
SHOE POLISHES, WAXES AND COLORANTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			6.00	.03	1.00	.13	.98	.13	.98	12.09	91.14	12.09	91.14
ANTISTATIC SPRAYS													
FORMULATIONS 1,2			3.00	.03	1.00	0.00	.03	0.00	.03	0.00	1.40	0.00	1.40
ADHESIVES (5) (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,3,6 (2)			3277.50	.03	1.00	0.00	.85	0.00	.85	0.00	43181.06	0.00	43181.06
CAULKING AND SEALING CPDS (5) (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			432.80	.03	1.00	0.00	.20	0.00	.20	0.00	1341.68	0.00	1341.68
CARPET DEODORIZERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1			65.00	.03	.96	.02	.02	.02	.02	19.34	19.34	19.34	19.34
DRAIN OPENERS (AEROSOL AND NON-AEROSOL)													
LIQUIDS													
FORMULATIONS 2 (NO VOC)			17 (MIL.GAL.)	.03	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOLIDS													
FORMULATIONS 1			293.00	.03	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUB-TOTAL										1079.23	52310.63	1075.66	52059.19
PERSONAL PRODUCTS													
SHAVING LATHERS													
FORMULATIONS 2,4	162.60	.50		.03	1.07	.03	.09	.03	.09	41.85	120.15	41.85	120.15
HAIR SPRAYS													
FORMULATIONS 1,4	270.70	.63		.03	.87	.88	.97			2026.08	2242.25	1681.11	2242.25
FORMULATIONS 4,5	270.70	.63		.03	.87			.73	.97				
STYLING MOUSSE													
FORMULATIONS 1	106.10	.38		.03	1.00	.24	.24	.24	.24	153.11	153.11	153.11	153.11

Table 5 (Continued)
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRI BUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTI-PLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
OTHER HAIR CARE PRODUCTS-SHAMPOO													
(AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2,3 (2)			644.60	.03	1.00	0.00	.01	0.00	.01	0.00	49.96	0.00	49.96
PHARMACEUTICALS													
FORMULATIONS 1,3	43.70	.25		.03	.98	.70	.99			116.00	165.12		
FORMULATIONS 2,3	43.70	.25		.03	.98			.70	.99			116.00	165.12
COLOGNES													
FORMULATIONS 1	44.00	.12		.03	1.00	1.00	1.00	1.00	1.00	85.25	85.25	85.25	85.25
PERFUMES													
FORMULATIONS 1	82.00	.03		.03	1.00	1.00	1.00	1.00	1.00	38.13	38.13	38.13	38.13
AFTERSHAVES													
FORMULATIONS 1	23.00	.25		.03	1.00	.65	.65	.65	.65	57.75	57.75	57.75	57.75
PERSONAL DEODORANTS AND ANTI-PERSPIRANTS													
FORMULATIONS 1,2	156.00	.25		.03	.89	.80	.95	.80	.95	430.40	511.10	430.40	511.10
OTHER PERSONAL CARE PRODUCTS													
SUNTAN LOTIONS (2)													
FORMULATIONS 1,4,5 (2)	15.1	.13		.03	1.06	0.00	.65	0.00	.65	0.00	20.96	0.00	20.96
DEPILATORIES													
FORMULATIONS 1,2	15.10	.13		.03	1.08	.10	.10	.10	.10	3.29	3.45	3.29	3.45
SUB-TOTAL										2951.86	3447.24	2606.89	3447.24
---------										--------	--------	--------	--------
ANIMAL PRODUCTS													
VETERINARIAN AND PET PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
---------										-----	-----	-----	-----
AUTOMOTIVE AND INDUSTRIAL PRODUCTS													
REFRIGERANTS										NA	NA	NA	NA
CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 4,7	14.70	.88		.03	1.00	0.00	1.00	0.00	1.00	0.00	199.37	0.00	199.37

Table 5 (Continued)
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
ENGINE DEGREASERS													
FORMULATIONS 1,2,3 (2)	23.90	.88		.03	1.00	.89	1.00			289.14	324.14		
FORMULATIONS 3	23.90	.88		.03	1.00			.75	1.00			243.11	324.14
LUBRICANTS AND SILICONES													
FORMULATIONS 1,2	75.40	.44		.03	1.00	0.00	1.00	0.00	1.00	0.00	514.23	0.00	514.23
UNDERCOATINGS													
FORMULATIONS 1	8.30	.75		.03	1.00	.25	.85	.25	.85	24.12	82.01	24.12	82.01
BRAKE CLEANERS													
FORMULATIONS 1, 2, or 3	16.60	1.13		.03	1.00	1.00	1.00	1.00	1.00	290.75	290.75	290.75	290.75
TIRE SEALANTS AND INFLATORS													
FORMULATIONS	19.30	.69		.03	1.00					NA	NA	NA	NA
CARBURETOR AND CHOKE CLEANERS													
FORMULATIONS 2,3	39.80	.75		.03	1.00	.28	1.00	.28	1.00	129.55	462.67	129.55	462.67
ENGINE STARTING FLUIDS													
FORMULATIONS 1	30.80	.56		.03	1.00	1.00	1.00	1.00	1.00	267.34	267.34	267.34	267.34
WINDSHIELD DEICER (AEROSOL AND NON)													
FORMULATIONS 1,2	10.40	1.00		.03	1.00	.75	1.00	.75	1.00	120.90	161.20	120.90	161.20
OTHER AUTO AND INDUSTRIAL PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										1121.80	2301.72	1075.77	2301.72
---------										-------	-------	-------	-------
MISCELLANEOUS PRODUCTS													
HERBICIDES AND FUNGICIDES													
FORMULATIONS 1,7			69.00	.03	1.00	0.00	.95	0.00	.95	0.00	1016.02	0.00	1016.02
SUB-TOTAL										0.00	1016.02	0.00	1016.02
---------										-----	-----	-----	-----
NON-AEROSOL PRODUCTS													

PERSONAL PRODUCTS													
NAIL POLISHES										NA	NA	NA	NA
NAIL POLISH REMOVERS										NA	NA	NA	NA

Table 5 (Continued)
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRI BUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTI-PLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
PERSONAL DEODORANTS AND ANTI-PIRSPIRANTS										NA	NA	NA	NA
SHAVING LATHERS										NA	NA	NA	NA
PRE-SHAVE PREPARATIONS										NA	NA	NA	NA
AFTER-SHAVE LOTIONS & COLOGNES (LISTED UNDER AEROSOL)										NA	NA	NA	NA
PERFUMES (LISTED UNDER AEROSOL)										NA	NA	NA	NA
RUBBING COMPOUNDS (ALCOHOL)										NA	NA	NA	NA
FACE WASHES (LIKE ASTRINGENTS)										NA	NA	NA	NA
FACIAL CREAMS AND WASHES										NA	NA	NA	NA
HAND LOTIONS										NA	NA	NA	NA
SUN LOTIONS, CREAMS AND OILS (LISTED UNDER AEROSOL)										NA	NA	NA	NA
MOUTHWASHES										NA	NA	NA	NA
HAIR SPRAYS										NA	NA	NA	NA
HAIR SHAMPOOS, RINSES AND OTHER HAIR PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
HOUSEHOLD PRODUCTS													
SHOE POLISHES										NA	NA	NA	NA
BALL POINT AND POROUS POINT PENS										NA	NA	NA	NA
ROOM DEODORANTS AND DISINFECTANTS										NA	NA	NA	NA
CLEANERS													
OVEN CLEANERS										NA	NA	NA	NA
RUG AND UPHOLSTERY CLEANERS										NA	NA	NA	NA
WINDOW AND GLASS CLEANERS										NA	NA	NA	NA
FLOOR CLEANERS										NA	NA	NA	NA
TILE AND BATHROOM CLEANERS										NA	NA	NA	NA

Table 5 (Continued)

VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
WALL CLEANERS										NA	NA	NA	NA
WAXES AND POLISHES (LIQUIDS)													
FORMULATIONS 2,3			3.00	.03	1.00	.24	.94	.24	.94	11.16	43.71	11.16	43.71
FLOOR WAXES OR POLISHES													
FORMULATIONS 1,2,3 (2)			27.00	.03	1.02	.20	.20	.20	.20	85.37	85.37	85.37	85.37
RUG DEODORIZERS AND FRESHENERS										NA	NA	NA	NA
LAUNDRY SPOT REMOVERS										NA	NA	NA	NA
MOTH CONTROL PRODUCTS										NA	NA	NA	NA
METAL CLEANERS AND POLISHES													
FORMULATIONS 2,3,4,5,7 (2)			24.00	.03	1.00	0.00	1.00	0.00	1.00	0.00	372.00	0.00	372.00
HOUSEHOLD ADHESIVES										NA	NA	NA	NA
FURNITURE POLISHES AND WAXES										NA	NA	NA	NA
SUB-TOTAL										96.53	501.08	96.53	501.08
AUTOMOTIVE													
AUTO ANTIFREEZES													
FORMULATIONS 1			22.30	.03	1.00	.95	.95	.95	.95	328.37	328.37	328.37	328.37
CAR POLISHES AND WAXES													
FORMULATIONS 1,2	189.10	1.00		.03	.90	.42	.42	.42	.42	1115.85	1118.49	1115.85	1118.49
WINDSHIELD WASHER FLUID										NA	NA	NA	NA
SUB-TOTAL										1444.22	1446.86	1444.22	1446.86
GARAGE PRODUCTS													
HOUSEHOLD GLUE AND BONDING AGENTS										NA	NA	NA	NA
HOUSEHOLD CAULKS AND SEALANTS										NA	NA	NA	NA
INSECTICIDES										NA	NA	NA	NA
HERBICIDES										NA	NA	NA	NA
FUNGICIDES										NA	NA	NA	NA
BARBECUE LIGHTER FLUIDS										NA	NA	NA	NA
AUTO WINDSHIELD WASHERS										NA	NA	NA	NA

Table 5 (Continued)
VOC AND PROC EMISSIONS IN NEW JERSEY

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
DEGREASERS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
TOTAL EMISSIONS										10269.36	68096.71	9501.79	67845.27

(1) Products in these sub-categories are aerosol unless it is indicated that aerosol and non-aerosol are combined.
(2) More than two listed formulations indicates that several product formulations had the same low or high weight percent.
(3) Suntan lotion use varies strongly with season. However, the total emission estimate is independent of seasonal fluctuation.
(4) NA indicates that emissions could not be calculated because either product use or formulation data were not available.
(5) Includes industrial, commercial, and consumer products.

Table 6
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRI BUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTI-PLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
AEROSOL/NON-AEROSOL PRODUCTS (1)													
INSECT SPRAY PRODUCTS													
INSECT SPRAYS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,8			192.5	.05	1.00	.05	1.00	0.00	1.00	221.38	4427.50	0.00	4427.50
INSECT REPELLENTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,5			12.00	.05	1.00	.35	.85	.35	.85	96.32	234.60	96.32	234.60
MOTH CONTROL PRODUCTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			39.00	.05	1.00	.96	1.00	.96	1.00	861.12	893.41	861.12	893.41
ANIMAL INSECTICIDES (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 3,4			6.00	.05	1.00	.55	1.00	.55	1.00	75.90	137.59	75.90	137.59
SUB-TOTAL										1254.72	5693.10	1033.34	5693.10
PAINTS AND FINISHES													
PAINTS, PRIMERS, VARNISHES						.73	.87			3980.02	4731.37		
FORMULATIONS 5,6	300.60	.75		.05	1.05							3647.89	4731.37
FORMULATIONS 3,6	300.60	.75		.05	1.05			.67	.87				
OTHER RELATED PRODUCTS													
FORMULATIONS 1	6.9	.69		.05	1.00	.65	.65	.65	.65	71.18	71.18	71.18	71.18
SUB-TOTAL										4051.19	4802.55	3719.07	4802.55
HOUSEHOLD PRODUCTS													
ROOM DEODORANTS AND DISINFECTANTS (AEROSOL AND NON-AEROSOL)						.35	1.00			1018.87	2870.05		
FORMULATIONS 2,4	265.50	.50		.05	.94							1018.87	2496.95
FORMULATIONS 1.4	265.50	.50		.05	.94			.35	.87				

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
CLEANERS													
TILE AND BATHROOM CLEANERS													
FORMULATIONS 1,2,3,4,5 (2)			65.00	.05	1.00	0.00	.33			0.00	493.35		
FORMULATIONS 2,3,4,5 (2)			65.00	.05	1.00			0.00	.33			0.00	493.35
OVEN CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 3,4			33.00	.05	1.00	0.00	.20	0.00	.20	0.00	151.80	0.00	151.80
RUG AND UPHOLSTERY CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,3			115.00	.05	1.00	.03	.26	.03	.26	89.93	687.70	89.93	687.70
ALL PURPOSE CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			512.00	.05	1.00	.02	.41	.02	.41	235.52	4816.38	235.52	4816.38
WINDOW AND GLASS CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 6,7			174.00	.05	1.00	0.00	.42	0.00	.42	0.00	1680.84	0.00	1680.84
LAUNDRY PRODUCTS-AEROSOLS STARCH, FABRIC FINISH													
FORMULATIONS 1,2	109.90	.75		.05	1.00	.05	.11	.05	.11	92.89	212.33	92.89	212.33
LAUNDRY PRODUCTS (AEROSOL AND NON-AEROSOL)													
PREWASH STAIN REMOVERS													
FORMULATIONS 1,2			84.00	.05	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPOT REMOVERS													
FORMULATIONS 1,2			2.30	.05	1.00	1.00	1.00	.90	1.00	52.90	52.90	47.61	52.90
WAXES AND POLISHES													
FORMULATIONS 1,3			58.00	.05	1.00	.07	.34	.07	.34	93.38	453.56	93.38	453.56
ALL OTHER HOUSEHOLD SPRAY PRODUCTS													
FORMULATIONS	45.2	.75		.05	1.00					NA (4)	NA	NA	NA

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
OTHER HAIR CARE PRODUCTS-SHAMPOO (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2,3 (2)			644.60	.05	1.00	0.00	.01	0.00	.01	0.00	74.13	0.00	74.13
PHARMACEUTICALS													
FORMULATIONS 1,3	43.70	.25		.05	.98	.70	.99			172.13	245.02		
FORMULATIONS 2,3	43.70	.25		.05	.98			.70	.99			172.13	245.02
COLOGNES													
FORMULATIONS 1	44.00	.12		.05	1.00	1.00	1.00	1.00	1.00	126.50	126.50	126.50	126.50
PERFUMES													
FORMULATIONS 1	82.00	.03		.05	1.00	1.00	1.00	1.00	1.00	56.58	56.58	56.58	56.58
AFTERSHAVES													
FORMULATIONS 1	23.00	.25		.05	1.00	.65	.65	.65	.65	85.70	85.70	85.70	85.70
PERSONAL DEODORANTS AND ANTI-PERSPIRANTS													
FORMULATIONS 1,2	156.00	.25		.05	.89	.80	.95	.80	.95	638.66	758.41	638.66	758.41
OTHER PERSONAL CARE PRODUCTS													
SUNTAN LOTIONS (2)													
FORMULATIONS 1,4,5 (2)	15.1	.13		.05	1.06	0.00	.65	0.00	.65	0.00	31.11	0.00	31.11
DEPILATORIES													
FORMULATIONS 1,2	15.10	.13		.05	1.08	.10	.10	.10	.10	4.88	5.12	4.88	5.12
SUB-TOTAL										4380.17	5115.26	3868.30	5115.26
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ANIMAL PRODUCTS													
VETERINARIAN AND PET PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
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AUTOMOTIVE AND INDUSTRIAL PRODUCTS													
REFRIGERANTS													
CLEANERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 4,7	14.70	.88		.05	1.00	0.00	1.00	0.00	1.00	0.00	295.84	0.00	295.84

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
SHOE POLISHES, WAXES AND COLORANTS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			6.00	.05	1.00	.13	.98	.13	.98	17.94	135.24	17.94	135.24
ANTISTATIC SPRAYS													
FORMULATIONS 1,2			3.00	.05	1.00	0.00	.03	0.00	.03	0.00	2.07	0.00	2.07
ADHESIVES (5) (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 2,3,6 (2)			3277.50	.05	1.00	0.00	.65	0.00	.65	0.00	64075.12	0.00	64075.12
CAULKING AND SEALING CPDS (5) (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1,2			432.80	.05	1.00	0.00	.20	0.00	.20	0.00	1990.88	0.00	1990.88
CARPET DEODORIZERS (AEROSOL AND NON-AEROSOL)													
FORMULATIONS 1			65.00	.05	.96	.02	.02	.02	.02	28.70	28.70	28.70	26.70
DRAIN OPENERS (AEROSOL AND NON-AEROSOL)													
LIQUIDS													
FORMULATIONS 2 (NO VOC)			17 (MIL.GAL.)	.05	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOLIDS													
FORMULATIONS 1			293.00	.05	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUB-TOTAL										1601.43	77622.23	1596.14	77249.12
PERSONAL PRODUCTS													
SHAVING LATHERS													
FORMULATIONS 2,4	162.80	.50		.05	1.07	.03	.09	.03	.09	62.10	178.29	62.10	178.29
HAIR SPRAYS													
FORMULATIONS 1,4	270.70	.63		.05	.87	.88	.97			3006.43	3327.21		
FORMULATIONS 4,5	270.70	.63		.05	.87			.73	.97			2494.56	3327.21
STYLING MOUSSE													
FORMULATIONS 1	106.10	.38		.05	1.00	.24	.24	.24	.24	227.19	227.19	227.19	227.19

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
ENGINE DEGREASERS													
FORMULATIONS 1,2,3 (2)	23.90	.88		.05	1.00	.89	1.00			429.04	480.99		
FORMULATIONS 3	23.90	.88		.05	1.00			.75	1.00			360.74	480.99
LUBRICANTS AND SILICONES													
FORMULATIONS 1,2	75.40	.44		.05	1.00	0.00	1.00	0.00	1.00	0.00	763.05	0.00	763.05
UNDERCOATINGS													
FORMULATIONS 1	8.30	.75		.05	1.00	.25	.85	.25	.85	35.79	121.70	35.79	121.70
BRAKE CLEANERS													
FORMULATIONS 1, 2, or 3	16.60	1.13		.05	1.00	1.00	1.00	1.00	1.00	431.43	431.43	431.43	431.43
TIRE SEALANTS AND INFLATORS													
FORMULATIONS	19.30	.69		.05	1.00					NA	NA	NA	NA
CARBURETOR AND CHOKE CLEANERS													
FORMULATIONS 2,3	39.80	.75		.05	1.00	.28	1.00	.28	1.00	192.23	686.55	192.23	686.55
ENGINE STARTING FLUIDS													
FORMULATIONS 1	30.80	.56		.05	1.00	1.00	1.00	1.00	1.00	396.70	396.70	396.70	396.70
WINDSHIELD DEICER (AEROSOL AND NON)													
FORMULATIONS 1,2	10.40	1.00		.05	1.00	.75	1.00	.75	1.00	179.40	239.20	179.40	239.20
OTHER AUTO AND INDUSTRIAL PRODUCTS										NA	NA	NA	NA
SUB-TOTAL										1664.61	3415.46	1596.31	3415.46
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MISCELLANEOUS PRODUCTS													
HERBICIDES AND FUNGICIDES													
FORMULATIONS 1,7			69.00	.05	1.00	0.00	.95	0.00	.95	0.00	1507.65	0.00	1507.65
SUB-TOTAL										0.00	1507.65	0.00	1507.65
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NON-AEROSOL PRODUCTS													

PERSONAL PRODUCTS													
NAIL POLISHES										NA	NA	NA	NA
NAIL POLISH REMOVERS										NA	NA	NA	NA

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
PERSONAL DEODORANTS AND ANTI-PIRSPIRANTS										NA	NA	NA	NA
SHAVING LATHERS										NA	NA	NA	NA
PRE-SHAVE PREPARATIONS										NA	NA	NA	NA
AFTER-SHAVE LOTIONS & COLOGNES (LISTED UNDER AEROSOL)										NA	NA	NA	NA
PERFUMES (LISTED UNDER AEROSOL)										NA	NA	NA	NA
RUBBING COMPOUNDS (ALCOHOL)										NA	NA	NA	NA
FACE WASHES (LIKE ASTRINGENTS)										NA	NA	NA	NA
FACIAL CREAMS AND WASHES										NA	NA	NA	NA
HAND LOTIONS										NA	NA	NA	NA
SUN LOTIONS, CREAMS AND OILS (LISTED UNDER AEROSOL)										NA	NA	NA	NA
MOUTHWASHES										NA	NA	NA	NA
HAIR SPRAYS										NA	NA	NA	NA
HAIR SHAMPOOS, RINSES AND OTHER HAIR PRODUCTS (SEE AEROSOL)										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
---------										----	----	----	----
HOUSEHOLD PRODUCTS													
SHOE POLISHES										NA	NA	NA	NA
BALL POINT AND POROUS POINT PENS										NA	NA	NA	NA
ROOM DEODORANTS AND DISINFECTANTS										NA	NA	NA	NA
CLEANERS													
OVEN CLEANERS										NA	NA	NA	NA
RUG AND UPHOLSTERY CLEANERS										NA	NA	NA	NA
WINDOW AND GLASS CLEANERS										NA	NA	NA	NA
FLOOR CLEANERS										NA	NA	NA	NA
TILE AND BATHROOM CLEANERS										NA	NA	NA	NA

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC LOW	WEIGHT FRACTION VOC HIGH	WEIGHT FRACTION PROC LOW	WEIGHT FRACTION PROC HIGH	TOTAL VOC EMISSIONS (TONS) LOW	TOTAL VOC EMISSIONS (TONS) HIGH	TOTAL PROC EMISSIONS (TONS) LOW	TOTAL PROC EMISSIONS (TONS) HIGH
WALL CLEANERS										NA	NA	NA	NA
WAXES AND POLISHES (LIQUIDS)			3.00	.05	1.00	.24	.94	.24	.94	16.56	64.86	16.56	64.86
FORMULATIONS 2,3													
FLOOR WAXES OR POLISHES			27.00	.05	1.02	.20	.20	.20	.20	126.68	126.68	126.68	126.68
FORMULATIONS 1,2,3 (2)													
RUG DEODORIZERS AND FRESHENERS										NA	NA	NA	NA
LAUNDRY SPOT REMOVERS										NA	NA	NA	NA
MOTH CONTROL PRODUCTS										NA	NA	NA	NA
METAL CLEANERS AND POLISHES			24.00	.05	1.00	0.00	1.00	0.00	1.00	0.00	552.00	0.00	552.00
FORMULATIONS 2,3,4,5,7 (2)													
HOUSEHOLD ADHESIVES										NA	NA	NA	NA
FURNITURE POLISHES AND WAXES										NA	NA	NA	NA
SUB-TOTAL										143.24	743.54	143.24	743.54
AUTOMOTIVE													
AUTO ANTIFREEZES			22.30	.05	1.00	.95	.95	.95	.95	487.25	487.25	487.25	487.25
FORMULATIONS 1													
CAR POLISHES AND WAXES	189.10	1.00		.05	.90	.42	.42	.42	.42	1655.78	1659.69	1655.78	1659.69
FORMULATIONS 1,2													
WINDSHIELD WASHER FLUID										NA	NA	NA	NA
SUB-TOTAL										2143.03	2146.95	2143.03	2146.95
GARAGE PRODUCTS													
HOUSEHOLD GLUE AND BONDING AGENTS										NA	NA	NA	NA
HOUSEHOLD CAULKS AND SEALANTS										NA	NA	NA	NA
INSECTICIDES										NA	NA	NA	NA
HERBICIDES										NA	NA	NA	NA
FUNGICIDES										NA	NA	NA	NA
BARBECUE LIGHTER FLUIDS										NA	NA	NA	NA
AUTO WINDSHIELD WASHERS										NA	NA	NA	NA

Table 6 (Continued)
VOC AND PROC EMISSIONS IN NEW YORK

PRODUCT	MILLION UNITS DISTRIBUTED	AVG. PROD. WT. (LB)	NATIONAL CONSUMPTION (MILLION LB)	POP. APPORT.	GEOGR. MULTIPLIER	WEIGHT FRACTION VOC		WEIGHT FRACTION PROC		TOTAL VOC EMISSIONS (TONS)		TOTAL PROC EMISSIONS (TONS)	
						LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
DEGREASERS										NA	NA	NA	NA
SUB-TOTAL										0.00	0.00	0.00	0.00
---------										----	----	----	----
TOTAL EMISSIONS										15238.40	101046.74	14099.44	100673.63

(1) Products in these sub-categories are aerosol unless it is indicated that aerosol and non-aerosol are combined.

(2) More than two listed formulations indicates that several product formulations had the same low or high weight percent.

(3) Suntan lotion use varies strongly with season. However, the total emission estimate is independent of seasonal fluctuation.

(4) NA indicates that emissions could not be calculated because either product use or formulation data were not available.

(5) Includes industrial, commercial, and consumer products.

6. CONCLUSIONS

Tables 7, 8, and 9 summarize PROC and VOC emission estimates for consumer products. The consumer product subcategories are arranged in descending order according to the high PROC emission estimate, the low PROC emission estimate, and an average of the two estimates. Only those product categories for which all data are available are listed.

If the low PROC emissions estimates (Table 7) are assumed to be more realistic, the categories with the largest emissions are:

- Paints, primers, and varnishes
- Hair sprays
- Car polishes and waxes
- Room deodorants and disinfectants
- Moth control products.

If the high PROC emissions estimates (Table 8) are assumed to most closely reflect the actual emissions, the categories of greatest emissions are:

- Adhesives
- Paints, primers, and varnishes
- All purpose cleaners
- Insect sprays
- Hair sprays
- Room deodorants and disinfectants.

If the average of the high and the low emissions estimates (Table 9) is assumed to be the most realistic, the product categories with the largest emissions are:

- Adhesives
- Paints, primers, and varnishes
- Hair sprays
- All purpose cleaners

- Insect sprays
- Car polishes and waxes
- Room deodorants and disinfectants.

These seven subcategories account for approximately 85 percent of the average PROC releases even though they represent less than 20 percent of the product subcategories. Adhesives alone account for over 56 percent of total PROC emissions.

Use data for adhesives and caulking and sealing compounds included industrial as well as consumer use. If consumers use only 10 percent of the adhesives, the seven product categories still release approximately 70 percent of the average PROC emissions. Adhesives would continue to be a major source of PROC emissions.

The range of possible total VOC and PROC emissions is quite large. Annual California VOC emissions, for example, vary from a low of 38,800 tons to a high of 245,000 tons. The low/high VOC and PROC ratios reported in Tables 10, 11, and 12, indicate a wide variation in emission estimation precision. This variation between the low and high VOC and PROC estimates is accounted for by the uncertainties in the distribution, consumption, and formulation data for many subcategories. For household products in California, the low VOC or PROC is estimated to be only 2 percent of the high VOC or PROC, whereas for personal products the low estimate is 86 percent of the high estimate for VOC, and 76 percent for PROC. The insect spray category, with low/high VOC and PROC ratios of 0.22 and 0.18, respectively, is the other product category with a wide emissions estimate range. Taking into consideration all products, the low/high VOC estimate is 0.16, while the similar PROC ratio is 0.15.

In general, the amount of PROC emitted is very similar to that of VOC emitted. This is not unexpected, given the relatively few volatile organic compounds not considered to be photoreactive. The nonphotoreactive volatile organic compounds that were found in the formulations were: carbon dioxide (propellent), methylene chloride, and 1,1,1-trichloroethane. These compounds appear not to be in widespread use in consumer products, explaining the similarity in VOC and PROC emissions.

Very little data were available for emissions of VOC and PROC from nonaerosol products. Data collected by SAIC in an earlier report on organic compound emissions in California (Rogozen et al., 1985) have been examined in an attempt to decrease the uncertainty in this area. Estimated emissions from several nonaerosol products are reported in Table 13. This remains an incomplete list of nonaerosol products, but it sheds some light on the approximate fraction of total VOC emissions that might be omitted from the inventory. The total VOC emitted from nonaerosol products was 19,504 tons/yr (Rogozen et al., 1985). This represents 8 percent of the high estimate of VOC emitted in California. However, a more realistic assessment of the omitted nonaerosol component, assuming VOC emissions are only an average of the reported low and high figures, is 13 percent of total VOC emissions. This means that our emission inventory probably has omitted between 8 and 13 percent of actual VOC emitted by consumer products. This estimate is likely to be somewhat conservative, since not all omitted products have been taken into account.

Tables 14, 15, and 16 indicate per capita emissions of VOC and PROC by product subcategory. The average per capita PROC emissions vary from approximately 9 to 11 lb/person/year. These results are somewhat larger than the 6.3 lb/person/year recommended for estimating PROC by the EPA (EPA, 1980).

However, two factors suggest that these results are not directly comparable with the EPA data. The first is the large proportion of total emissions contributed by adhesives (in household products). It was not possible to disaggregate industrial and consumer use of adhesives; therefore, our total includes industrial as well as consumer use. Based upon industry estimates (Broxterman, 1983), we may assume that 95 percent of the use of these products is industrial and 5 percent consumer. Per capita average PROC emissions are estimated to be: California, 5.40 lb; New Jersey, 4.38 lb; and New York, 5.02 lb, after subtracting the industrial proportion of adhesives and adjusting the average per capita emissions.

The second adjustment factor stems from the lack of data for many nonaerosol subcategories. Using the SAIC derived emission data (Rogozen et al., 1985), reported in Table 13, as a partial adjustment for this omission, we now find the per capita annual emissions for these three regions to be: California, 6.97 lb/person; New Jersey, 5.95 lb/person; and New York, 6.59 lb/person. Thus, our final estimates are very close to the earlier EPA estimate. These estimates are likely to be somewhat conservative since only some of the unavailable emissions data have been replaced by the SAIC study data.

Future Efforts

The results of this study indicate that the EPA estimate of PROC emissions of 6.3 lb/person/year is likely to be fairly accurate. Nonetheless, these results were derived from data with considerable uncertainty. Each stage of the data collection process presented accuracy and validity problems, including defining "typical" products for a subcategory, disaggregating aerosol and nonaerosol for industrial and consumer products, assessing distribution or consumption by subcategory, knowing percent VOC or PROC within any product, and finding the relative distribution of each of the products for any subcategory. Thus, for some categories, the range of emissions from low to high VOC or PROC is quite large.

Given these problems, it would be difficult to use the results as the basis for calculating actual reductions in emissions of reactive hydrocarbons as a result of regulation. However, these results may fruitfully be used as the basis for targeting further research, and as the basis for focusing on specific industries with a potential for substantial emission reductions. For example, industrial users of adhesives would be a logical category to focus upon.

Future research efforts would probably be better spent in focusing on those areas which have the greatest potential for emission reduction, such as adhesives, paints, hair sprays and cleaners. More detailed knowledge in these subcategories about the specific amounts, types, and distribution patterns of PROC emissions is likely to produce the greatest results.

There are two potentially rewarding research paths to pursue to gain additional detailed information. Both require substantial expenditures of time and money. The first is to purchase marketing data from the large marketing research firms such as Simmons or Kline, with their detailed formulation and distribution data sets. The second is to track down individual industries, either through a survey or through telephone calls and personal visits with knowledgeable industry officials. It is likely that individual companies have the required data but will not release them without the proper authority, since they consider such information proprietary.

TABLE 7. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF LOW TOTAL PROC EMISSIONS

STATE OF CALIFORNIA
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
PAINTS, PRIMERS, VARNISHES	A	10,424	12,392	11,408	9,554	12,392	10,973
HAIR SPRAYS	A	7,685	8,505	8,095	6,377	8,505	7,441
CAR POLISHES & WAXES	N	4,619	4,630	4,625	4,619	4,630	4,625
ROOM DEODORANTS & DISINFECTANTS	A	2,436	6,863	4,650	2,436	5,971	4,204
MOTH CONTROL PRODUCTS	A/N	2,059	2,136	2,098	2,059	2,136	2,098
PERSONAL DEODORANTS	A	1,476	1,752	1,614	1,476	1,752	1,614
AUTO ANTIFREEZES	N	1,165	1,165	1,165	1,165	1,165	1,165
BREAK CLEANERS	A	1,032	1,032	1,032	1,032	1,032	1,032
ENGINE STARTING FLUIDS	A	949	949	949	949	949	949
ENGINE DEGREASERS	A	1,026	1,150	1,088	863	1,150	1,006
ALL PURPOSE CLEANERS	A	603	12,324	6,463	603	12,324	6,463
STYLING MOUSE	A	543	543	543	543	543	543
CARBURETOR & CHOKE CLEANERS	A	460	1,642	1,051	460	1,642	1,051
PHARMACEUTICALS	A	454	646	550	454	646	550
WINDSHIELD DEICER	A/N	429	572	501	429	572	501
FLOOR WAXES OR POLISHES	N	309	309	309	309	309	309
COLOGNES	A	303	303	303	303	303	303
INSECT REPELLENTS	A/N	230	561	396	230	561	396
STARCH & FABRIC FINISH	A	222	508	365	222	508	365
RUG & UPHOLSTERY CLEANERS	A	215	1,645	930	215	1,645	930
WAXES & POLISHES	A	212	1,030	621	212	1,030	621
AFTERSHAVES	A	205	205	205	205	205	205
ANIMAL INSECTICIDES	A	182	329	255	182	329	255
PAINTS-OTHER RELATED PRODUCTS	A	170	170	170	170	170	170
SHAVING LATHERS	A	140	402	271	140	402	271
PERFUMES	A	135	135	135	135	135	135
SPOT REMOVERS	A/N	127	127	127	114	127	120
UNDERCOATINGS	A	86	291	188	86	291	188
CARPET DEODORIZERS	A/N	69	69	69	69	69	69
SHOE POLISHES, WAXES & COLORANTS	A/N	43	323	183	43	323	183
WAXES & POLISHES LIQUIDS	N	40	155	97	40	155	97
DEPILATORIES	A	11	12	11	11	12	11
ADHESIVES	A	0	153,223	76,612	0	153,223	76,612
INSECT SPRAYS	A/N	529	10,588	5,558	0	10,588	5,294
CAULKING & SEALING COMPOUNDS	A/N	0	4,761	2,380	0	4,761	2,380
WINDOW & GLASS CLEANERS	A/N	0	3,939	1,970	0	3,939	1,970
HERBICIDES, FUNGICIDES	A/N	0	3,605	1,803	0	3,605	1,803
LUBRICANTS AND SILICONES	A	0	1,825	913	0	1,825	913
METAL CLEANERS & POLISHES	N	0	1,320	660	0	1,320	660
TILE & BATHROOM CLEANERS	A	0	1,180	590	0	1,180	590
AUTO CLEANERS	A/N	0	707	354	0	707	354
OVEN CLEANERS	A/N	0	370	185	0	370	185
HAIR CARE PRODUCTS - SHAMPOOS	A/N	0	177	89	0	177	89
SUNTAN LOTIONS	A	0	81	41	0	81	41
ANTI-STATIC SPRAYS	A	0	5	3	0	5	3
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		38,587	244,656	141,622	35,703	243,764	139,734

TABLE 7. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF LOW TOTAL PROC EMISSIONS (continued)

NEW YORK
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
PAINTS, PRIMERS, VARNISHES	A	3,980	4,731	4,356	3,648	4,731	4,190
HAIR SPRAYS	A	3,006	3,327	3,167	2,495	3,327	2,911
CAR POLISHES & WAXES	N	1,656	1,660	1,658	1,656	1,660	1,658
ROOM DEODORANTS & DISINFECTANTS	A	1,019	2,870	1,944	1,019	2,497	1,758
MOTH CONTROL PRODUCTS	A/N	861	893	877	861	893	877
PERSONAL DEODORANTS	A	639	758	699	639	758	699
AUTO ANTIFREEZES	N	487	487	487	487	487	487
BRAKE CLEANERS	A	431	431	431	431	431	431
ENGINE STARTING FLUIDS	A	397	397	397	397	397	397
ENGINE DEGREASERS	A	429	481	455	361	481	421
ALL PURPOSE CLEANERS	A	236	4,816	2,526	236	4,816	2,526
STYLING MOUSE	A	227	227	227	227	227	227
CARBURETOR & CHOKE CLEANERS	A	192	687	439	192	687	439
WINDSHIELD DEICER	a/n	179	239	209	179	239	209
PHARMACEUTICALS	A	172	245	209	172	245	209
FLOOR WAXES OR POLISHES	N	127	127	127	127	127	127
COLOGNES	A	127	127	127	127	127	127
INSECT REPELLENTS	A/N	96	235	165	96	235	165
WAXES & POLISHES	A	93	454	273	93	454	273
STARCH & FABRIC FINISH	A	93	212	153	93	212	153
RUG & UPHOLSTERY CLEANERS	A	90	688	389	90	688	389
AFTERSHAVES	A	86	86	86	86	86	86
ANIMAL INSECTICIDES	A	76	138	107	76	138	107
PAINTS-OTHER RELATED PRODUCTS	A	71	71	71	71	71	71
SHAVING LATHERS	A	62	178	120	62	178	120
PERFUMES	A	57	57	57	57	57	57
SPOT REMOVERS	A/N	53	53	53	48	53	50
UNDERCOATINGS	A	36	122	79	36	122	79
CARPET DEODORIZERS	A/N	29	29	29	29	29	29
SHOE POLISHES, WAXES & COLORANTS	A/N	18	135	77	18	135	77
WAXES & POLISHES LIQUIDS	N	17	65	41	17	65	41
DEPILATORIES	A	5	5	5	5	5	5
ADHESIVES	A	0	64,075	32,038	0	64,075	32,038
INSECT SPRAYS	A/N	221	4,428	2,324	0	4,428	2,214
CAULKING & SEALING COMPOUNDS	A/N	0	1,991	995	0	1,991	995
WINDOW & GLASS CLEANERS	A/N	0	1,681	840	0	1,681	840
HERBICIDES AND FUNGICIDES	A/N	0	1,508	754	0	1,508	754
LUBRICANTS AND SILICONES	A	0	763	382	0	763	382
METAL CLEANERS & POLISHES	N	0	552	276	0	552	276
TILE & BATHROOM CLEANERS	A	0	493	247	0	493	247
AUTO CLEANERS	A/N	0	296	148	0	296	148
OVEN CLEANERS	A/N	0	152	76	0	152	76
HAIR CARE PRODUCTS - SHAMPOOS	A/N	0	74	37	0	74	37
SUNTAN LOTIONS	A	0	31	16	0	31	16
ANTI-STATIC SPRAYS	A	0	2	1	0	2	1
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		15,267	101,075	58,171	14,128	100,702	57,415

TABLE 7. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF LOW TOTAL PROC EMISSIONS (continued)

STATE OF NEW JERSEY
VOC & PROC EMISSIONS

	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
CONSUMER PRODUCT SUB-CATEGORY		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
PAINTS, PRIMERS, VARNISHES	A	2,682	3,189	2,935	2,458	3,189	2,823
HAIR SPRAYS	A	2,026	2,242	2,134	1,681	2,242	1,962
CAR POLISHES & WAXES	N	1,116	1,118	1,117	1,116	1,118	1,117
ROOM DEODORANTS & DISINFECTANTS	A	687	1,934	1,310	687	1,683	1,185
MOTH CONTROL PRODUCTS	A/N	580	602	591	580	602	591
PERSONAL DEODORANTS	A	430	511	471	430	511	471
AUTO ANTIFREEZES	N	328	328	328	328	328	328
BRAKE CLEANERS	A	291	291	291	291	291	291
ENGINE STARTING FLUIDS	A	267	267	267	267	267	267
ENGINE DEGREASERS	A	289	324	307	243	324	284
ALL PURPOSE CLEANERS	A	159	3,246	1,702	159	3,246	1,702
STYLING MOUSE	A	153	153	153	153	153	153
CARBURETOR & CHOKE CLEANERS	A	130	463	296	130	463	296
WINDSHIELD DEICER	A/N	121	161	141	121	161	141
PHARMACEUTICALS	A	116	165	141	116	165	141
FLOOR WAXES OR POLISHES	N	85	85	85	85	85	85
COLOGNES	A	85	85	85	85	85	85
INSECT REPELLENTS	A/N	65	158	112	65	158	112
WAXES & POLISHES	A	63	306	184	63	306	184
STARCH & FABRIC FINISH	A	63	143	103	63	143	103
RUG & UPHOLSTERY CLEANERS	A	61	463	262	61	463	262
AFTERSHAVES	A	58	58	58	58	58	58
ANIMAL INSECTICIDES	A	51	93	72	51	93	72
PAINTS-OTHER RELATED PRODUCTS	A	48	48	48	48	48	48
SHAVING LATHERS	A	42	120	81	42	120	81
PERFUMES	A	38	38	38	38	38	38
SPOT REMOVERS	A/N	36	36	36	32	36	34
UNDERCOATINGS	A	24	82	53	24	82	53
CARPET DEODORIZERS	A/N	19	19	19	19	19	19
SHOE POLISHES, WAXES & COLORANTS	A/N	12	91	52	12	91	52
WAXES & POLISHES LIQUIDS	N	11	44	27	11	44	27
DEPILATORIES	A	3	3	3	3	3	3
ADHESIVES	A	0	43,181	21,591	0	43,181	21,591
INSECT SPRAYS	A/N	149	2,984	1,566	0	2,984	1,492
CAULKING & SEALING COMPOUNDS	A/N	0	1,342	671	0	1,342	671
WINDOW & GLASS CLEANERS	A/N	0	1,133	566	0	1,133	566
HERBICIDES AND FUNGICIDES	A/N	0	1,016	508	0	1,016	508
LUBRICANTS AND SILICONES	A	0	514	257	0	514	257
METAL CLEANERS & POLISHES	N	0	372	186	0	372	186
TILE & BATHROOM CLEANERS	A	0	332	166	0	332	166
AUTO CLEANERS	A/N	0	199	100	0	199	100
OVEN CLEANERS	A/N	0	102	51	0	102	51
HIAR CARE PRODUCT - SHAMPOOS	A/N	0	50	25	0	50	25
SUNTAN LOTIONS	A	0	21	10	0	21	10
ANTI-STATIC SPRAYS	A	0	1	1	0	1	1
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		10,288	68,114	39,201	9,521	67,863	38,692

TABLE 8. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF HIGH TOTAL PROC EMISSIONS

STATE OF CALIFORNIA
VOC & PROC EMISSIONS

	AEROSOL/ NON-AER.	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
CONSUMER PRODUCT SUB-CATEGORY	(A/N)	LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
ADHESIVES	A	0	153,223	76,612	0	153,223	76,612
PAINTS, PRIMERS, VARNISHES	A	10,424	12,392	11,408	9,554	12,392	10,973
ALL PURPOSE CLEANERS	A	603	12,324	6,463	603	12,324	6,463
INSECT SPRAYS	A/N	529	10,588	5,558	0	10,588	5,294
HAIR SPRAYS	A	7,685	8,505	8,095	6,377	8,505	7,441
ROOM DEODORANTS & DISINFECTANTS	A	2,436	6,863	4,650	2,436	5,971	4,204
CAULKING & SEALING COMPOUNDS	A/N	0	4,761	2,380	0	4,761	2,380
CAR POLISHES & WAXES	N	4,619	4,630	4,625	4,619	4,630	4,625
WINDOW & GLASS CLEANERS	A/N	0	3,939	1,970	0	3,939	1,970
HERBICIDES, FUNGICIDES	A/N	0	3,605	1,803	0	3,605	1,803
MOTH CONTROL PRODUCTS	A/N	2,059	2,136	2,098	2,059	2,136	2,098
LUBRICANTS AND SILICONES	A	0	1,825	913	0	1,825	913
PERSONAL DEODORANTS	A	1,476	1,752	1,614	1,476	1,752	1,614
RUG & UPHOLSTERY CLEANERS	A	215	1,645	930	215	1,645	930
CARBURETOR & CHOKE CLEANERS	A	460	1,642	1,051	460	1,642	1,051
METAL CLEANERS & POLISHES	N	0	1,320	660	0	1,320	660
TILE & BATHROOM CLEANERS	A	0	1,180	590	0	1,180	590
AUTO ANTIFREEZES	N	1,165	1,165	1,165	1,165	1,165	1,165
ENGINE DEGREASERS	A	1,026	1,150	1,088	863	1,150	1,006
BREAK CLEANERS	A	1,032	1,032	1,032	1,032	1,032	1,032
WAXES & POLISHES	A	212	1,030	621	212	1,030	621
ENGINE STARTING FLUIDS	A	949	949	949	949	949	949
AUTO CLEANERS	A/N	0	707	354	0	707	354
PHARMACEUTICALS	A	454	646	550	454	646	550
WINDSHIELD DEICER	A/N	429	572	501	429	572	501
INSECT REPELLENTS	A/N	230	561	396	230	561	396
STYLING MOUSE	A	543	543	543	543	543	543
STARCH & FABRIC FINISH	A	222	508	365	222	508	365
SHAVING LATHERS	A	140	402	271	140	402	271
OVEN CLEANERS	A/N	0	370	185	0	370	185
ANIMAL INSECTICIDES	A	182	329	255	182	329	255
SHOE POLISHES, WAXES & COLORANTS	A/N	43	323	183	43	323	183
FLOOR WAXES OR POLISHES	N	309	309	309	309	309	309
COLOGNES	A	303	303	303	303	303	303
UNDERCOATINGS	A	86	291	188	86	291	188
AFTERSHAVES	A	205	205	205	205	205	205
HAIR CARE PRODUCTS - SHAMPOOS	A/N	0	177	89	0	177	89
PAINTS-OTHER RELATED PRODUCTS	A	170	170	170	170	170	170
WAXES & POLISHES LIQUIDS	N	40	155	97	40	155	97
PERFUMES	A	135	135	135	135	135	135
SPOT REMOVERS	A/N	127	127	127	114	127	120
SUNTAN LOTIONS	A	0	81	41	0	81	41
CARPET DEODORIZERS	A/N	69	69	69	69	69	69
DEPILATORIES	A	11	12	11	11	12	11
ANTI-STATIC SPRAYS	A	0	5	3	0	5	3
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		38,587	244,656	141,622	35,703	243,764	139,734

TABLE 8. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF HIGH TOTAL PROC EMISSIONS (continued)

STATE OF NEW YORK
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
ADHESIVES	A	0	64,075	32,038	0	64,075	32,038
ALL PURPOSE CLEANERS	A	236	4,816	2,526	236	4,816	2,526
PAINTS, PRIMERS, VARNISHES	A	3,980	4,731	4,356	3,648	4,731	4,190
INSECT SPRAYS	A/N	221	4,428	2,324	0	4,428	2,214
HAIR SPRAYS	A	3,006	3,327	3,167	2,495	3,327	2,911
ROOM DEODORANTS & DISINFECTANTS	A	1,019	2,870	1,944	1,019	2,497	1,758
CAULKING & SEALING COMPOUNDS	A/N	0	1,991	995	0	1,991	995
WINDOW & GLASS CLEANERS	A/N	0	1,681	840	0	1,681	840
CAR POLISHES & WAXES	N	1,656	1,660	1,658	1,656	1,660	1,658
HERBICIDES AND FUNGICIDES	A/N	0	1,508	754	0	1,508	754
MOTH CONTROL PRODUCTS	A/N	861	893	877	861	893	877
LUBRICANTS AND SILICONES	A	0	763	382	0	763	382
PERSONAL DEODORANTS	A	639	758	699	639	758	699
RUG & UPHOLSTERY CLEANERS	A	90	688	389	90	688	389
CARBURETOR & CHOKE CLEANERS	A	192	687	439	192	687	439
METAL CLEANERS & POLISHES	N	0	552	276	0	552	276
TILE & BATHROOM CLEANERS	A	0	493	247	0	493	247
AUTO ANTIFREEZES	N	487	487	487	487	487	487
ENGINE DEGREASERS	A	429	481	455	361	481	421
WAXES & POLISHES	A	93	454	273	93	454	273
BRAKE CLEANERS	A	431	431	431	431	431	431
ENGINE STARTING FLUIDS	A	397	397	397	397	397	397
AUTO CLEANERS	A/N	0	296	148	0	296	148
PHARMACEUTICALS	A	172	245	209	172	245	209
WINDSHIELD DEICER	a/n	179	239	209	179	239	209
INSECT REPELLENTS	A/N	96	235	165	96	235	165
STYLING MOUSE	A	227	227	227	227	227	227
STARCH & FABRIC FINISH	A	93	212	153	93	212	153
SHAVING LATHERS	A	62	178	120	62	178	120
OVEN CLEANERS	A/N	0	152	76	0	152	76
ANIMAL INSECTICIDES	A	76	138	107	76	138	107
SHOE POLISHES, WAXES & COLORANTS	A/N	18	135	77	18	135	77
FLOOR WAXES OR POLISHES	N	127	127	127	127	127	127
COLOGNES	A	127	127	127	127	127	127
UNDERCOATINGS	A	36	122	79	36	122	79
AFTERSHAVES	A	86	86	86	86	86	86
HAIR CARE PRODUCTS - SHAMPOOS	A/N	0	74	37	0	74	37
PAINTS-OTHER RELATED PRODUCTS	A	71	71	71	71	71	71
WAXES & POLISHES LIQUIDS	N	17	65	41	17	65	41
PERFUMES	A	57	57	57	57	57	57
SPOT REMOVERS	A/N	53	53	53	48	53	50
SUNTAN LOTIONS	A	0	31	16	0	31	16
CARPET DEODORIZERS	A/N	29	29	29	29	29	29
DEPILATORIES	A	5	5	5	5	5	5
ANTI-STATIC SPRAYS	A	0	2	1	0	2	1
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		15,267	101,075	58,171	14,128	100,702	57,415

TABLE 8. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF HIGH TOTAL PROC EMISSIONS (continued)

STATE OF NEW JERSEY
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
ADHESIVES	A	0	43,181	21,591	0	43,181	21,591
ALL PURPOSE CLEANERS	A	159	3,246	1,702	159	3,246	1,702
PAINTS, PRIMERS, VARNISHES	A	2,682	3,189	2,935	2,458	3,189	2,823
INSECT SPRAYS	A/N	149	2,984	1,566	0	2,984	1,492
HAIR SPRAYS	A	2,026	2,242	2,134	1,681	2,242	1,962
ROOM DEODORANTS & DISINFECTANTS	A	687	1,934	1,310	687	1,683	1,185
CAULKING & SEALING COMPOUNDS	A/N	0	1,342	671	0	1,342	671
WINDOW & GLASS CLEANERS	A/N	0	1,133	566	0	1,133	566
CAR POLISHES & WAXES	N	1,116	1,118	1,117	1,116	1,118	1,117
HERBICIDES AND FUNGICIDES	A/N	0	1,016	508	0	1,016	508
MOTH CONTROL PRODUCTS	A/N	580	602	591	580	602	591
LUBRICANTS AND SILICONES	A	0	514	257	0	514	257
PERSONAL DEODORANTS	A	430	511	471	430	511	471
RUG & UPHOLSTERY CLEANERS	A	61	463	262	61	463	262
CARBURETOR & CHOKE CLEANERS	A	130	463	296	130	463	296
METAL CLEANERS & POLISHES	N	0	372	186	0	372	186
TILE & BATHROOM CLEANERS	A	0	332	166	0	332	166
AUTO ANTIFREEZES	N	328	328	328	328	328	328
ENGINE DEGREASERS	A	289	324	307	243	324	284
WAXES & POLISHES	A	63	306	184	63	306	184
BRAKE CLEANERS	A	291	291	291	291	291	291
ENGINE STARTING FLUIDS	A	267	267	267	267	267	267
AUTO CLEANERS	A/N	0	199	100	0	199	100
PHARMACEUTICALS	A	116	165	141	116	165	141
WINDSHIELD DEICER	A/N	121	161	141	121	161	141
INSECT REPELLENTS	A/N	65	158	112	65	158	112
STYLING MOUSE	A	153	153	153	153	153	153
STARCH & FABRIC FINISH	A	63	143	103	63	143	103
SHAVING LATHERS	A	42	120	81	42	120	81
OVEN CLEANERS	A/N	0	102	51	0	102	51
ANIMAL INSECTICIDES	A	51	93	72	51	93	72
SHOE POLISHES, WAXES & COLORANTS	A/N	12	91	52	12	91	52
FLOOR WAXES OR POLISHES	N	85	85	85	85	85	85
COLOGNES	A	85	85	85	85	85	85
UNDERCOATINGS	A	24	82	53	24	82	53
AFTERSHAVES	A	58	58	58	58	58	58
HIAR CARE PRODUCT - SHAMPOOS	A/N	0	50	25	0	50	25
PAINTS-OTHER RELATED PRODUCTS	A	48	48	48	48	48	48
WAXES & POLISHES LIQUIDS	N	11	44	27	11	44	27
PERFUMES	A	38	38	38	38	38	38
SPOT REMOVERS	A/N	36	36	36	32	36	34
SUNTAN LOTIONS	A	0	21	10	0	21	10
CARPET DEODORIZERS	A/N	19	19	19	19	19	19
DEPILATORIES	A	3	3	3	3	3	3
ANTI-STATIC SPRAYS	A	0	1	1	0	1	1
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		10,288	68,114	39,201	9,521	67,863	38,692

TABLE 9. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF AVERAGE TOTAL PROC EMISSIONS

STATE OF CALIFORNIA
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
ADHESIVES	A	0	153,223	76,612	0	153,223	76,612
PAINTS, PRIMERS, VARNISHES	A	10,424	12,392	11,408	9,554	12,392	10,973
HAIR SPRAYS	A	7,685	8,505	8,095	6,377	8,505	7,441
ALL PURPOSE CLEANERS	A	603	12,324	6,463	603	12,324	6,463
INSECT SPRAYS	A/N	529	10,588	5,558	0	10,588	5,294
CAR POLISHES & WAXES	N	4,619	4,630	4,625	4,619	4,630	4,625
ROOM DEODORANTS & DISINFECTANTS	A	2,436	6,863	4,650	2,436	5,971	4,204
CAULKING & SEALING COMPOUNDS	A/N	0	4,761	2,380	0	4,761	2,380
MOTH CONTROL PRODUCTS	A/N	2,059	2,136	2,098	2,059	2,136	2,098
WINDOW & GLASS CLEANERS	A/N	0	3,939	1,970	0	3,939	1,970
HERBICIDES, FUNGICIDES	A/N	0	3,605	1,803	0	3,605	1,803
PERSONAL DEODORANTS	A	1,476	1,752	1,614	1,476	1,752	1,614
AUTO ANTIFREEZES	N	1,165	1,165	1,165	1,165	1,165	1,165
CARBURETOR & CHOKE CLEANERS	A	460	1,642	1,051	460	1,642	1,051
BREAK CLEANERS	A	1,032	1,032	1,032	1,032	1,032	1,032
ENGINE DEGREASERS	A	1,026	1,150	1,088	863	1,150	1,006
ENGINE STARTING FLUIDS	A	949	949	949	949	949	949
RUG & UPHOLSTERY CLEANERS	A	215	1,645	930	215	1,645	930
LUBRICANTS AND SILICONES	A	0	1,825	913	0	1,825	913
METAL CLEANERS & POLISHES	N	0	1,320	660	0	1,320	660
WAXES & POLISHES	A	212	1,030	621	212	1,030	621
TILE & BATHROOM CLEANERS	A	0	1,180	590	0	1,180	590
PHARMACEUTICALS	A	454	646	550	454	646	550
STYLING MOUSE	A	543	543	543	543	543	543
WINDSHIELD DEICER	A/N	429	572	501	429	572	501
INSECT REPELLENTS	A/N	230	561	396	230	561	396
STARCH & FABRIC FINISH	A	222	508	365	222	508	365
AUTO CLEANERS	A/N	0	707	354	0	707	354
FLOOR WAXES OR POLISHES	N	309	309	309	309	309	309
COLOGNES	A	303	303	303	303	303	303
SHAVING LATHERS	A	140	402	271	140	402	271
ANIMAL INSECTICIDES	A	182	329	255	182	329	255
AFTERSHAVES	A	205	205	205	205	205	205
UNDERCOATINGS	A	86	291	188	86	291	188
OVEN CLEANERS	A/N	0	370	185	0	370	185
SHOE POLISHES, WAXES & COLORANTS	A/N	43	323	183	43	323	183
PAINTS-OTHER RELATED PRODUCTS	A	170	170	170	170	170	170
PERFUMES	A	135	135	135	135	135	135
SPOT REMOVERS	A/N	127	127	127	114	127	120
WAXES & POLISHES LIQUIDS	N	40	155	97	40	155	97
HAIR CARE PRODUCTS - SHAMPOOS	A/N	0	177	89	0	177	89
CARPET DEODORIZERS	A/N	69	69	69	69	69	69
SUNTAN LOTIONS	A	0	81	41	0	81	41
DEPILATORIES	A	11	12	11	11	12	11
ANTI-STATIC SPRAYS	A	0	5	3	0	5	3
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		38,587	244,656	141,622	35,703	243,764	139,734

TABLE 9. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER
OF AVERAGE TOTAL PROC EMISSIONS (continued)

STATE OF NEW YORK
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
ADHESIVES	A	0	64,075	32,038	0	64,075	32,038
PAINTS, PRIMERS, VARNISHES	A	3,980	4,731	4,356	3,648	4,731	4,190
HAIR SPRAYS	A	3,006	3,327	3,167	2,495	3,327	2,911
ALL PURPOSE CLEANERS	A	236	4,816	2,526	236	4,816	2,526
INSECT SPRAYS	A/N	221	4,428	2,324	0	4,428	2,214
ROOM DEODORANTS & DISINFECTANTS	A	1,019	2,870	1,944	1,019	2,497	1,758
CAR POLISHES & WAXES	N	1,656	1,660	1,658	1,656	1,660	1,658
CAULKING & SEALING COMPOUNDS	A/N	0	1,991	995	0	1,991	995
MOTH CONTROL PRODUCTS	A/N	861	893	877	861	893	877
WINDOW & GLASS CLEANERS	A/N	0	1,681	840	0	1,681	840
HERBICIDES AND FUNGICIDES	A/N	0	1,508	754	0	1,508	754
PERSONAL DEODORANTS	A	639	758	699	639	758	699
AUTO ANTIFREEZES	N	487	487	487	487	487	487
CARBURETOR & CHOKE CLEANERS	A	192	687	439	192	687	439
BRAKE CLEANERS	A	431	431	431	431	431	431
ENGINE DEGREASERS	A	429	481	455	361	481	421
ENGINE STARTING FLUIDS	A	397	397	397	397	397	397
RUG & UPHOLSTERY CLEANERS	A	90	688	389	90	688	389
LUBRICANTS AND SILICONES	A	0	763	382	0	763	382
METAL CLEANERS & POLISHES	N	0	552	276	0	552	276
WAXES & POLISHES	A	93	454	273	93	454	273
TILE & BATHROOM CLEANERS	A	0	493	247	0	493	247
STYLING MOUSE	A	227	227	227	227	227	227
WINDSHIELD DEICER	a/n	179	239	209	179	239	209
PHARMACEUTICALS	A	172	245	209	172	245	209
INSECT REPELLENTS	A/N	96	235	165	96	235	165
STARCH & FABRIC FINISH	A	93	212	153	93	212	153
AUTO CLEANERS	A/N	0	296	148	0	296	148
FLOOR WAXES OR POLISHES	N	127	127	127	127	127	127
COLOGNES	A	127	127	127	127	127	127
SHAVING LATHERS	A	62	178	120	62	178	120
ANIMAL INSECTICIDES	A	76	138	107	76	138	107
AFTERSHAVES	A	86	86	86	86	86	86
UNDERCOATINGS	A	36	122	79	36	122	79
SHOE POLISHES, WAXES & COLORANTS	A/N	18	135	77	18	135	77
OVEN CLEANERS	A/N	0	152	76	0	152	76
PAINTS-OTHER RELATED PRODUCTS	A	71	71	71	71	71	71
PERFUMES	A	57	57	57	57	57	57
SPOT REMOVERS	A/N	53	53	53	48	53	50
WAXES & POLISHES LIQUIDS	N	17	65	41	17	65	41
HAIR CARE PRODUCTS - SHAMPOOS	A/N	0	74	37	0	74	37
CARPET DEODORIZERS	A/N	29	29	29	29	29	29
SUNTAN LOTIONS	A	0	31	16	0	31	16
DEPILATORIES	A	5	5	5	5	5	5
ANTI-STATIC SPRAYS	A	0	2	1	0	2	1
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		15,267	101,075	58,171	14,128	100,702	57,415

TABLE 9. CONSUMER PRODUCT SUB-CATEGORIES RANKED IN ORDER OF AVERAGE TOTAL PROC EMISSIONS (continued)

STATE OF NEW JERSEY
VOC & PROC EMISSIONS

CONSUMER PRODUCT SUB-CATEGORY	AEROSOL/ NON-AER. (A/N)	TOTAL VOC EMISSIONS (tons)			TOTAL PROC EMISSIONS (tons)		
		LOW	HIGH	AVERAGE	LOW	HIGH	AVERAGE
ADHESIVES	A	0	43,181	21,591	0	43,181	21,591
PAINTS, PRIMERS, VARNISHES	A	2,682	3,189	2,935	2,458	3,189	2,823
HAIR SPRAYS	A	2,026	2,242	2,134	1,681	2,242	1,962
ALL PURPOSE CLEANERS	A	159	3,246	1,702	159	3,246	1,702
INSECT SPRAYS	A/N	149	2,984	1,566	0	2,984	1,492
ROOM DEODORANTS & DISINFECTANTS	A	687	1,934	1,310	687	1,683	1,185
CAR POLISHES & WAXES	N	1,116	1,118	1,117	1,116	1,118	1,117
CAULKING & SEALING COMPOUNDS	A/N	0	1,342	671	0	1,342	671
MOTH CONTROL PRODUCTS	A/N	580	602	591	580	602	591
WINDOW & GLASS CLEANERS	A/N	0	1,133	566	0	1,133	566
HERBICIDES AND FUNGICIDES	A/N	0	1,016	508	0	1,016	508
PERSONAL DEODORANTS	A	430	511	471	430	511	471
AUTO ANTIFREEZES	N	328	328	328	328	328	328
CARBURETOR & CHOKE CLEANERS	A	130	463	296	130	463	296
BRAKE CLEANERS	A	291	291	291	291	291	291
ENGINE DEGREASERS	A	289	324	307	243	324	284
ENGINE STARTING FLUIDS	A	267	267	267	267	267	267
RUG & UPHOLSTERY CLEANERS	A	61	463	262	61	463	262
LUBRICANTS AND SILICONES	A	0	514	257	0	514	257
METAL CLEANERS & POLISHES	N	0	372	186	0	372	186
WAXES & POLISHES	A	63	306	184	63	306	184
TILE & BATHROOM CLEANERS	A	0	332	166	0	332	166
STYLING MOUSE	A	153	153	153	153	153	153
WINDSHIELD DEICER	A/N	121	161	141	121	161	141
PHARMACEUTICALS	A	116	165	141	116	165	141
INSECT REPELLENTS	A/N	65	158	112	65	158	112
STARCH & FABRIC FINISH	A	63	143	103	63	143	103
AUTO CLEANERS	A/N	0	199	100	0	199	100
FLOOR WAXES OR POLISHES	N	85	85	85	85	85	85
COLOGNES	A	85	85	85	85	85	85
SHAVING LATHERS	A	42	120	81	42	120	81
ANIMAL INSECTICIDES	A	51	93	72	51	93	72
AFTERSHAVES	A	58	58	58	58	58	58
UNDERCOATINGS	A	24	82	53	24	82	53
SHOE POLISHES, WAXES & COLORANTS	A/N	12	91	52	12	91	52
OVEN CLEANERS	A/N	0	102	51	0	102	51
PAINTS-OTHER RELATED PRODUCTS	A	48	48	48	48	48	48
PERFUMES	A	38	38	38	38	38	38
SPOT REMOVERS	A/N	36	36	36	32	36	34
WAXES & POLISHES LIQUIDS	N	11	44	27	11	44	27
HIAR CARE PRODUCT - SHAMPOOS	A/N	0	50	25	0	50	25
CARPET DEODORIZERS	A/N	19	19	19	19	19	19
SUNTAN LOTIONS	A	0	21	10	0	21	10
DEPILATORIES	A	3	3	3	3	3	3
ANTI-STATIC SPRAYS	A	0	1	1	0	1	1
PREWASH STAIN REMOVERS	A/N	0	0	0	0	0	0
DRAIN OPENERS	A/N	0	0	0	0	0	0
TOTALS		10,288	68,114	39,201	9,521	67,863	38,692

TABLE 10. VOC AND PROC RATIOS FOR PRODUCT CATEGORIES IN CALIFORNIA

Product Categories	VOC (Low)/ VOC (High)	PROC (Low)/ PROC (High)	PROC (Low)/ VOC (Low)	PROC (High)/ VOC (High)
Aerosol Spray Products				
Insect Sprays	0.22	0.18	0.82	1.00
Paints and Finishes	0.84	0.77	0.92	1.00
Household Products	0.02	0.02	1.00	1.00
Personal Products	0.86	0.76	0.88	1.00
Animal Products	--	--	--	--
Automotive and Industrial Products	0.49	0.47	0.96	1.00
Miscellaneous Products	0.00	0.00	--	1.00
Non-Aerosol Products				
Personal Products	--	--	--	--
Household Products	0.20	.20	1.00	1.00
Automotive Products	1.00	1.00	1.00	1.00
Garage Products	--	--	--	--
Total Emissions	0.16	0.15	0.92	1.00

TABLE 11. VOC AND PROC RATIOS FOR PRODUCT CATEGORIES IN NEW YORK

Product Categories	VOC (Low)/ VOC (High)	PROC (Low)/ PROC (High)	PROC (Low)/ VOC (Low)	PROC (High)/ VOC (High)
Aerosol Spray Products				
Insect Sprays	0.22	0.18	0.82	1.00
Paints and Finishes	0.84	0.77	0.92	1.00
Household Products	0.02	0.02	1.00	1.00
Personal Products	0.86	0.76	.88	1.00
Animal Products	--	--	--	--
Automotive and Industrial Products	0.49	0.47	0.96	1.00
Miscellaneous Products	0.00	0.00	--	1.00
Non-Aerosol Products				
Personal Products	--	--	--	--
Household Products	0.19	0.19	1.00	1.00
Automotive Products	1.00	1.00	1.00	1.00
Garage Products	--	--	--	--
Total Emissions	0.15	0.14	0.93	1.00

TABLE 12. VOC AND PROC RATIOS FOR PRODUCT CATEGORIES IN NEW JERSEY

Product Categories	VOC (Low)/ VOC (High)	PROC (Low)/ PROC (High)	PROC (Low)/ VOC (Low)	PROC (High)/ VOC (High)
Aerosol Spray Products				
Insect Sprays	0.22	0.18	0.82	1.00
Paints and Finishes	0.84	0.77	0.92	1.00
Household Products	0.02	0.02	1.00	1.00
Personal Products	0.86	0.76	0.86	1.00
Animal Products	--	--	--	--
Automotive and Industrial Products	0.48	0.47	0.96	1.00
Miscellaneous Products	--	--	--	--
Non-Aerosol Products				
Personal Products	--	--	--	--
Household Products	0.19	0.19	1.00	1.00
Automotive Products	1.00	1.00	1.00	1.00
Garage Products	--	--	--	--
Total Emissions	0.15	0.14	0.93	1.00

TABLE 13. ADDITIONAL VOC AND PROC EMISSIONS

Product	Emissions (tons) CA	NJ[1]	NY[1]
Brake fluid for master cylinder (ethylene glycol monethyl ether: 88,000 tons x 0.2 estimated emission factor)	17,600	7,630	5,916
Gas driers (methanol)	600	260	201
Ball point and porous tip pens (ethylene glycol)	18	8	6
Rubbing alcohol	1,150	499	387
Nail polish	136	59	46
Total	19,504	8,456	6,556

[1] Based upon per capita emissions from California.

Source: Rogozen et al., (1985)

TABLE 14
PER CAPITA AVERAGE VOC AND PROC EMISSIONS (LB/PERSON)

Category		VOC			PROC	
	CA	NJ	NY	CA	NJ	NY
Aerosol:						
Insect Sprays	0.67	0.56	0.64	0.65	0.54	0.62
Paints and Finishes	0.93	0.71	0.82	0.89	0.69	0.79
Household Products	7.64	6.37	7.33	7.60	6.34	7.3
Personal Products	0.95	0.76	0.88	0.90	0.72	0.83
Automotive and Indust.	0.49	0.41	0.47	0.48	0.40	0.46
Herbicides and Fungicides	0.15	0.12	0.14	0.15	0.12	0.14
Non-Aerosol:						
Household	0.09	0.07	0.08	0.09	0.07	0.08
Automotive	0.46	0.35	0.40	0.46	0.35	0.40
Total Emissions	11.38	9.40	10.80	11.23	9.28	10.66

TABLE 15
PER CAPITA LOW VOC AND PROC EMISSIONS (LB/PERSON)

	VOC			PROC		
Category	CA	NJ	NY	CA	NJ	NY
Aerosol:						
Insect Sprays	0.24	0.20	0.23	0.20	0.17	0.19
Paints and Finishes	0.85	0.65	0.75	0.78	0.60	0.69
Household Products	0.32	0.26	0.30	0.32	0.26	0.30
Personal Products	0.88	0.70	0.81	0.77	0.62	0.72
Automotive and Indust.	0.32	0.27	0.31	0.30	0.26	0.30
Herbicides and Fungicides	0.00	0.00	0.00	0.00	0.00	0.00
Non-Aerosol:						
Household	0.03	0.02	0.03	0.03	0.02	0.03
Automotive	0.46	0.34	0.40	0.46	0.34	0.40
Total Emissions	3.11	2.49	2.85	2.88	2.31	2.64

TABLE 16
PER CAPITA HIGH VOC AND PROC EMISSIONS (LB/PERSON)

	VOC			PROC		
Category	CA	NJ	NY	CA	NJ	NY
Aerosol:						
Insect Sprays	1.09	0.92	1.05	1.09	0.92	1.05
Paints and Finishes	1.01	0.77	0.89	1.01	0.77	0.89
Household Products	14.96	12.49	14.39	14.89	12.43	14.30
Personal Products	1.02	0.82	0.95	1.02	0.82	0.95
Automotive and Indust.	0.66	0.55	0.63	0.66	0.55	0.63
Herbicides and Fungicides	0.29	0.24	0.26	0.29	0.24	0.28
Non-Aerosol:						
Household	0.14	0.11	0.14	0.14	0.11	0.14
Automotive	0.47	0.35	0.40	0.47	0.35	0.40
Total Emissions	19.65	16.30	18.74	19.58	16.24	18.67

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APPENDIX A

INSECTICIDES - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
192.5[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.031 (NJ)	

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

INSECTICIDE FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			86.5	86.5
Sevin	3.0	NV		
Malathion	4.0	NV		
Folpet (fungicide)	5.0	NV		
Kelthane	1.5	NV		
Inert ingredients	86.5	V		
Formula 2			100.0	100.0
DDVP	18.6	V		
Related compounds	1.4	V		
Inert ingredients	80.0	V		
Formula 3			99.3	99.3
d-trans Allethrin	0.50	NV		
(5-Benzyl-3-furyl) methyl-2, 2-dimethyl-3,2-methylpropenyl cyclopropane carboxylate	0.08	NV		
Related compounds	0.01	NV		
Petroleum distillate	10.20	V		
Sodium nitrite	0.08	-		
Inert ingredients	59.12	V		
Butane/Isobutane propellant	30.00*	V		
Formula 4			99.0	99.0
Baygon	1.00	NV		
DDVP	0.20	V		
Petroleum distillates	1.04	V		
Inert ingredients	67.91	V		
Butane/Isobutane	30.00*	V		
Formula 5			99.0	99.0
Pyrethrins	0.25	NV		
Piperonyl butoxide	0.80	NV		
Petroleum distillates	1.04	V		
Inert ingredients	67.91	V		
Butane/Isobutane	30.00*	V		

*Estimated from WAIB (1981) and CSMA (1986)

INSECTICIDE FORMULATIONS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 6			98.5	98.5
Pyrethrins	0.50	NV		
Piperonyl butoxide	1.00	NV		
Petroleum distillates	11.83	V		
Inert ingredients	58.00	V		
Butane/Isobutane	30.00*	V		
Formula 7			98.6	98.6
d-trans Allethrin	0.25	NV		
Piperonyll butoxide	0.80	NV		
MGK 264	0.40	NV		
Petroleum distillates	8.05	V		
Inert ingredients	60.50	V		
Butane/Isobutane	30.00*	V		
Formula 8			5.0	5.0
Zinc dimethyl/dithiocarbamate	0.12	NV		
Endosulphan	0.68	NV		
Pyrethrins	0.16	NV		
Sulphoxide	0.20	-		
Urea	0.40	NV		
Tensiofix LX	0.06	NV		
Tensiofix WP	0.04	NV		
Water	43.34	-		
CO_2 propellant	5	V		
Formula 9			99.9	99.9
Pyrethrins	0.06	NV		
Rotenone	0.01	V		
Other Cube resins	0.02	NV		
Pine oil	0.90	V		
Petroleum distillate	0.40	V		
Inert ingredients	68.61	V		
Butane/Isobutane	30.00	V		
Formula 10			55.5	55.5
Insecticide solution in Kerosene	15.5	V		
Span 85	1.5	NV		
Tween 81	1.0	NV		
Deionized water	42.0	-		
Butane	40.0	V		

*Estimated from WAIB (1981)
**Estimated from Chalimers/Bathe (1979)

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INSECT REPELLENTS - AEROSOL AND NONAEROSOL

National Shipment (million lb)	Population Apportionment	Geographic Multiplier
12[1]	.11 (CA)[2] .046 (NY) .031 (NJ)	NA

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[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

INSECT REPELLENT FORMULAS

	% Composition By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			85.0	85.0
N,N-Dialkyl-m-toluamide	14.25%	NV		
Other isomers	0.75	NV		
Inert ingredients	85.00	V		
Formula 2[a]			75.0	75.0
N,N-Dialkyl-m-toluamide	19.00%	NV		
Other isomers	1.00	NV		
N-Octyl-bicycloheptene dicarboximide	4.00	NV		
2,3,4,5-Bis (2-butylene) tetrahydro-2-furaldehyde	1.00	NV		
Inert ingredients	75.00	V		
Formula 3[a]			62.9	62.9
N,N-Dialkyl-m-toluamide	30.69%	NV		
Other isomers	1.00	NV		
N-Octyl-bicycloheptene dicarboximide	4.31	NV		
2,3,4,5-Bis (2-butylene) tetrahydro-2-furaldehyde	1.08	NV		
Inert Ingredients	62.92	V		
Formula 4[a]			75.0	75.0
2-Ethyl-1,3-hexanediol	25.00%	NV		
N,N-Diethyl-m-toluamide	4.75	NV		
Other isomers	0.25	NV		
Inert ingredients and propellant	70.00	V		
Formula 5[a]			34.9	34.9
2-Ethyl-1,3-hexandeiol	56.00%	NV		
N,N-Diethyl-m-toluamide	8.65	NV		
Other Isomers	0.45	NV		
Inert Ingredients	34.90	V		

[a] Kline (1982)

MOTH CONTROL PRODUCTS - AEROSOLS AND NONAEROSOLS

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
39[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.031 (NJ)	

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

MOTH CONTROL PRODUCT FORMULAS

	% Composition By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			96.0	96.0
Pyrethrin	0.15	NV		
Allethrin	0.15	NV		
N-octyl bicycloheptene dicarboximide	0.75	NV		
Piperonyl butoxide	0.50	NV		
Essential cedar oil	0.50	NV		
Petroleum distillates	52.95	V		
Inert ingredients	45.00	V		
Formula 2[a]			99.6	99.6
Cyclopropane carboxylate				
Tetramethrin derivative	0.20	NV		
Phenoxybenzyl derivative	0.19	NV		
Related isomers	0.01	NV		
Isoparaffinic hydrocarbons	7.75	V		
Inert ingredients	91.85	V		

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[a] Kline (1982)

ANIMAL INSECTICIDES - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
6[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.031 (NJ)	

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

ANIMAL INSECTICIDE FORMULAS

	% Composition By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			92.9	92.9
Pyrethrins	.60	NV		
Piperonyl butoxide	.48	NV		
Methoxychlor	.50	NV		
Carbaryl (1-Naphthyl N-Methyl carbomate)	.50	NV		
2,3:4,5-Bis(2 Butylene) Tetrahydro-2-Furaldehyde	.24	NV		
Petroleum distillate	22.84	V		
Inert ingredients	65.38	V		
Unknown ingredients (assume half are volatile)	9.46	4.73%V		
Formula 2			94.9	94.9
o-Isoproxyphenyl methylcarbomate	.25	NV		
Inert ingredients	89.84	V		
Unknown ingredients (assume half are volatile)	10.11	5.05%V		
Formula 3[a]			55.0	55.0
Benzyl Benzoate	33.80	NV		
Soap anhydrous	7.50	NV		
Chlordane	.75	NV		
Inert ingredients	52.05	V		
Unknown ingredients (assume half are volatile)	5.90	2.95%V		
Formula 4[b]			99.7	99.7
Pyrethrins	0.08%	NV		
Piperonyl butoxide	TRACE	NV		
2,3,4,5-Bis(2-Butylene) Tetrahydro-2-Furaldehyde	0.02	NV		
Petroleum distillate	7.77	V		
Inert ingredients	91.97	V		
Formula 5[b]			99.4	99.4
Pyrethrins	0.06%	NV		
Piperonyl butoxide	0.12	NV		
N-octylbicycloheptenedicarboximide	0.20	NV		
2,3,4,5-Bis(2-Butylene) Tetrahydro-2-Furaldehyde	0.20	NV		
Petroleum distillate	0.288	V		
Inert ingredients	99.132	V		

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[a] Source: Chalmers and Bathe (1979)
[b] Kline (1982)

PAINTS, PRIMERS, AND VARNISHES - AEROSOL

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lbs/unit)	Population Apportionment	Geographic Multiplier
300.6[1]	.75[2]	.11(CA)[3]	1.15(CA)[5]
		.046(NY)	1.05(NY)
		.031(NJ)	1.05(NJ)

[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

[4] Simmons (1983)

PAINT FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			84.1	70.6
	15/9			
Barium metaborate	0.8	-		
Aluminum paste	3.3	-		
Silicone resin	11.8	-		
Xylol and driers	40.0	V		
Aromatic hydrocarbons	5.6	V		
Methylene chloride	13.5	V (Non-PROC)		
Propane	12.5	V		
Isobutane	12.5	V		
Formulation 2[a]			82.0	82.0
Nonvolatile Compounds	18.0	NV		
Glycol ethers	1.2	V		
Aliphatic and aromatic hydrocarbons	32.8	V		
Halogenated hydrocarbons[1]	19.0	V		
Isobutane	14.5	V		
Propane	14.5	V		
Formulation 3[a]			82.0	67.0
Nonvolatile Compounds	18.0	NV		
Isobutane	30.0	V		
Propane	5.0	V		
Toluene	4.0	V		
Xylene	21.0	V		
Methylene chloride	15.0	V (Non-PROC)		
Cellosolve acetate	7.0	V		
Formulation 4[a]			84.2	84.2
Nonvolatile Compounds	15.8	NV		
Petroleum distillate	13.0	V		
Aromatic hydrocarbons	14.6	V		
Chlorinated solvents	27.0	V		
Aliphatic hydrocarbon propellant	29.6	V		

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[a] Poisindex (1984)

[1] Replaced by aliphatic hydrocarbons such as butane, propane.

PAINT FORMULAS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 5[a]			73.1	73.1
Nonvolatile Compounds	26.9%	NV		
Chlorinated solvents	21.0%	V		
Aliphatic hydrocarbons	23.1%	V		
Aliphatic thinner	29.0%	V		
Formulation 6[a]			86.9	86.9
Nonvolatile Compounds	13.1%	NV		
Dioctyl phthalate plasticizer	1.4%	V		
Aromatic hydrocarbons	9.5%	V		
Esters and ketones	11.0%	V		
Acetone and chlorinated solvents	35.0%	V		
Halogenated hydrocarbon propellant[1]	30.0%	V		

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[a] Poisindex (1984)

[1] Replaced by aliphatic hydrocarbons such as butane, propane.

PAINTS AND FINISHES - RELATED PRODUCTS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
6.9[1]	.69[2]	.11(CA)[3] .46(NY) .31(NJ)	NA

NA = not available

[1] CSMA (1984); millions of lbs sold in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

PAINTS AND FINISHES - OTHER RELATED PRODUCTS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]				
Isopropanol	65%			
Water	16%			
Phosphoric Acid	19%			

[a] Gosselin (1984)

ROOM DEODORANTS AND DISINFECTANTS - AEROSOLS AND NONAEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
265.5[1]	.5[2]	.11(CA)[3]	.94(CA)[4]
		.046(NY)	.94(NY)
		.031(NJ)	.94(NJ)

[1] Estimated from Simmons (1983)

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

[4] Simmons (1983)

ROOM DEODORANT FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			92.0	87.0
Triethylene glycol	3.0	NV		
Isopropyl alcohol	86.5	V		
Water	5.0	-		
Perfume	.5	V		
Carbon Dioxide	5.0	V		
Formula 2[a]			100.0	60.0
Propylene glycol	10.8	V		
Ethyl alcohol	48.0	V		
Methylene chloride	35.0	V		
Perfume	1.2	V		
Carbon dioxide	5.0	V		
Formula 3[a]			51.5	51.5
Perfume	0.5	V		
Span 85	1.3	NV		
Tween 81	0.7	NV		
Propylene glycol	3.0	V		
Triethylene glycol	2.0	NV		
Isopropyl alcohol	8.0	V		
Water (deionized)	44.5	-		
Butane	40.0	V		
Formula 4[a]			35.5	35.5
Triethylene glycol	3.00	NV		
Emulsifier	0.75	NV		
Sodium nitrate	0.05	-		
Perfume	0.50	V		
Water (deionized)	60.70	-		
Butane	35.00	V		

[a] Chalmers and Bathe (1979)

TILE AND BATHROOM CLEANER - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
65[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.036 (NJ)	

[1] Calculated from Kline (1982)

[2] U.S. Bureau of the Census (1986)

TILE AND BATHROOM CLEANER FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			2.4	2.4
O-Benzyl-p-chlorophenol	0.14%	NV		
Tetrasodium EDTA	4.56	NV		
Isopropyl alcohol	2.40	V		
Inert ingredients*	92.90	NV		
*Includes cleaners, detergents, and borax				
Formula 2[a]			0.0	0.0
Alkyldimethylbenzylammonium chloride	0.10%	NV		
Tetrasodium EDTA	1.52	NV		
Sodium metasilicate	0.06	-		
Inert ingredients	98.32	NV		
Formula 3[a]			0.0	0.0
Sodium o-phenylphenolate	0.20%	NV		
Tetrasodium EDTA	2.75	NV		
Sodium n-dodecylbenzene sulfonate	0.35	NV		
Inert ingredients	96.70	NV		
Formula 4[b]			0.0-33.0	0.0-33.0
Abrasive	88	NV		
Sodium tripolyphosphate	5	-		
Aklyl aryl sodium sulfonate	5	-		
Trisodium sulfonate	2	-		
Formula 5[b]			0.0	33.0
Stoddard solvent	0-31	V		
Morpholine	0-2	V		
Trisodium phosphate	0-3	-		
Soap	0-3	-		
Wetting agent	0-1	NV		
Silica	0-65	-		
Water	to 100	-		

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[a] Kline (1982)

[b] Gosselin (1985)

OVEN CLEANERS - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
33[1]	.11 (CA)[2]	1.02 (CA)[3]
	.046 (NY)	1.0 (NY)
	.031 (NJ)	1.0 (NJ)

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[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

OVEN CLEANER FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			8.5	8.5
Ammonium hydroxide	8	-		
Veegum T-a	2	NV		
1,1,1-Trichloroethane	24	V		
Tergitol NPX-b	24	NV		
Ethyl alcohol	10	V		
Water	32	-		
Above concentrate	25			
Propellant (Butane)	75	V		
Formula 2[a]				
Salt mixture-a	10.0	NV		
Calcium carbonate, up to	6.0	-		
Thickener	0.2	NV		
Surfactant	0.1	NV		
Biocide	q.s.			
Water, to make	100.0	-		
Formula 3[a]			20.0	20.0
Sodium hydroxide	10	-		
Kelzan-c	1	NV		
Veegum T-a		NV		
Antaron FC 34-d	2	NV		
Water	87	-		
Above concentrate	80			
Propellant (Butane)	20	V		
Formula 4[a]			0.0	0.0
Sodium hydroxide	10.0	-		
Sodium carboxymethyl-cellulose	7.0	NV		
Water, to make	100.0	-		

[a] Kline (1982)

RUG AND UPHOLSTERY CLEANERS - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
115[1]	.11 (CA)[2] .046 (NY) .031 (NJ)	NA

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

RUG AND UPHOLSTERY CLEANER FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			3.4	3.4
Sodium lauryl sulfate	5.4%	NV		
Dimethylene oxide	0.6	V		
Ethylene glycol monobutyl ether	2.8	V		
Preservatives and optical brighteners	1.0	NV		
Aqueous solution	91.0	-		
Formulation 2[a]			5.0	5.0
Water	85%	-		
Detergent	10	NV		
Butane propellant	5	V		
Formulation 3[b]			26.0	26.0
Bentonite	60-70	-		
Petroleum distillate (light)	26	V		
Wood flour	5	NV		
May contain:				
Salicylic acid	1	NV		

[a] Kline (1982)

[b] Gosselin (1985)

ALL PURPOSE CLEANERS - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
512[1]	.11 (CA)[2]	1.07 (CA)[3]
	.046 (NY)	1.0 (NY)
	.031 (NJ)	1.0 (NJ)

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

[3] Simmons (1983)

ALL PURPOSE CLEANER FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			2.0-4.0	2.0-4.0
Anionic and nonionic detergents	1-4	NV		
Alkaline builders	1-3	-		
Foam stabilizers	0-1	NV		
Solvents	2-4	V		
Chelating agents	0-1	NV		
Sodium xylene sulfonate or ethyl alcohol solubilizer	-	NV -		
Ammonia	0-1	-		
Water (including color and fragrance)	to 100	-		
Formulation 2[a]			40.9	40.9
Pine oil	30.0	V		
Isopropyl alcohol	10.9	V		
Soap	10.0	NV		
Ethyl alcohol	-	V		
EDTA	-	NV		
Inert ingredients	49.1	NV		

[a] Kline (1982)

WINDOW AND GLASS CLEANERS - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
174[1]	.11(CA)[2]	.98 (CA)[3]
	.046(NY)	1.0 (NY)
	0.31(NJ)	1.0 (NJ)

[1] Calculated from Kline (1982)

[2] U.S. Bureau of the Census (1986)

[3] Simmons (1983)

WINDOW AND GLASS CLEANER FORMULAS

	% Composition By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			0.1-7.5	0.1-7.5
Isopropyl alcohol	0.0-5.0	V		
Higher glycols or ethers	0.1-2.5	V		
Ammonia	0.1-0.2	-		
Surfactant	0.05-0.15	NV		
Alkaline builders	0-0.1	-		
Dye, fragrance	q.s.	V		
Water, to make	100%	-		
Formula 2[a]			7.0	7.0
Isopropyl alcohol	5.0	V		
Higher glycols	2.00	V		
Sodium lauryl sulfate-a	0.15	NV		
Ammonia, 28% solution	0.15	-		
Dye, fragrance	q.s	V		
Water, to make	100%	-		
Formula 3[a]			8.0	8.0
Dipropylene glycol monomethyl ether	4.0	V		
Isopropyl alcohol	4.0	V		
Pluronic F 108 detergent	0.1	NV		
Ammonium hydroxide, 28%	1.0	-		
Distilled water	90.0	-		
Formula 4[a]			14.1-39.1	14.1-39.1
Detergent	0.1-0.3	NV		
Ammonia	0.5-1.0	-		
Fragrance	0.1	V		
Isopropyl alcohol	10.0-35.0	V		
Water	60.0-85.0	-		
Propellant	4.0	V		
Formula 5[b]			6.0-25.0	6.0-25.0
Butyl cellosolve	3-5	V		
Alcohol	3-5	V		
Wetting agent	0.5-1	NV		
Isopropanol	0-15	V		
Dyes	trace	NV		
Silicone	trace	NV		
Water	to 100	-		

WINDOW AND GLASS CLEANER FORMULAS (Continued)

	% Composition By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 6[b]			17.0-42.0	17.0-42.0
Isopropyl alcohol	6-25	V		
Glycol ether	10-11	V		
Ethylene glycol	1	V		
Surfactant (usually an anionic but occasionally a nonionic, such as Triton X-200 or Turkey red oil)		NV		
Water	60-80	-		
Butane propellant	0-5	V		
Formual 7[b]			0.0-10.0	0.0-10.0
Pine oil	0-10	V		
Fatty acid soap	5-30	NV		
Synthetic anionic or nonionic surfactant	0-20	NV		
Sodium polyphosphates	0-15	-		
Amines	0-5	V		
Ammonia	0-5	-		

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[a] Kline (1982)

[b] Gosselin (1985)

LAUNDRY PRODUCTS - AEROSOLS
(STARCHES, SIZINGS)

U.S. Annual Unit Distribution	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
109.9[1]	.75[2]	.11(CA)[3] .046(NY) .031(NJ)	NA

NA = not available

[1] CSMA (1984); estimated millions of lbs filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

LAUNDRY PRODUCTS FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			11.2	11.2
Kosol predigested starch	5.0	NV		
Borax	.2	-		
Tinopax ANA	.2	NV		
Formaldehyde solution (30%)	.10	V		
Sodium nitrate	.15	-		
Silicone emulsion LE 463	.8	NV		
Perfume	.05	V		
Isopropyl alcohol	6.0	V		
Deionized water	82.5	-		
Butane	5.0	V		
Formula 2[a]			4.9	4.9
Gelva emulsion TS 31	3.18	NV		
Calgon	.01	NV		
Sindar technical G4-40	.03	NV		
Carboxymethyl cellulose	.11	NV		
Perfume	.01	V		
Deionized water	91.88	-		
Sapamine WL	.09	NV		
Butane	4.76	V		

[a] Chalmers and Bathe (1979)

LAUNDRY PRODUCTS - AEROSOLS AND NONAEROSOLS

National Consumption (millions lb)	Population Apportionment	Geographic Multiplier
Prewash Stain Removers		
84[1]	.11 (CA)[2] .046 (NY) .031 (NJ)	NA
Spot Removers		
2.3[1]	.11 (CA)[2] .046 (NY) .031 (NJ)	NA

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

LAUNDRY PRODUCT FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Prewash				
Formula 1[a]			0.0	0.0
Ethoxylated fatty alcohol sulfate	20.0	NV		
Isoparaffinic solvent	20.0	NV		
Triethanol amine oleate	3.5	NV		
Sodium xylene sulfonate	30.0	NV		
Water	25.5	-		
Formula 2[a]			0.0	0.0
Ethoxylated fatty alcohol sulfate	22.0	NV		
Isoparaffinic solvent	18.0	NV		
Triethanol amine oleate	2.5	NV		
Water	57.5	-		
Spot Removers				
Formula 1[a]			100.0	100.0
Trichloroethylene	75.0	V		
Butane/Isobutane	25.0	V		
Formula 2[a]			100.0	90.0
Perchloroethylene	65.0	V		
Methylene chloride	10.0	V		
Butane/Isobutane	25.0	V		

[a] Kline (1982)

WAXES AND POLISHES - AEROSOLS

National Consumption (millions lb)	Population Apportionment	Geographic Multiplier
Liquids		
3[1]	.11 (CA)[2]	.95 (CA)[3]
	.046 (NY)	1.0 (NY)
	.031 (NJ)	1.0 (NJ)
Aerosols		
58[1]	.11 (CA)[2]	.95 (CA)
	.046 (NY)	1.0 (NY)
	.031 (NJ)	1.0 (NJ)

[a] Kline (1982)

[b] U.S. Bureau of the Consensus (1986)

[c] Simmons (1983)

WAXES AND POLISHES - FORMULATIONS - AEROSOL

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Aerosols				
Formula 1[a]			7.0	7.0
Wax	0.5	NV		
Silicone oil	2.5	NV		
Emulsifier	0.5	NV		
Solvent	2.5	V		
Water	89.5	-		
Butane	4.5	V		
Formula 2[a]			32.0	32.0
Wax	2.0	NV		
Silicone oil	3.0	NV		
Emulsifier	1.0	NV		
Solvent	20.0	V		
Water	62.0	-		
Butane	12.00	V		
Formula 3[a]			34.0	34.0
Water	60.0	-		
Solvent	20.0	V		
Propellant (assume butane)	14.0	V		
Waxes and oils	5.0	NV		
Emulsifiers	1.0	NV		

[a] Kline (1982)

OTHER HOUSEHOLD PRODUCTS - AEROSOLS

U.S. Annual Unit Distribution	Average Unit Weight (Lbs/unit)	Population Apportionment	Seasonal Variation	Geographic Multiplier
45.2[1]	75[2]	.11(CA)[3] .046(NY) .031(NJ)	NA	NA

[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census, personal communication

SHOE POLISHES, WAXES, AND COLORANTS - AEROSOLS AND NONAEROSOLS

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
6[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.031 (NJ)	

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

SHOE POLISHES, WAXES, AND COLORANTS FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			13.0-14.0	13.0-14.0
Carnauba and other waxes	6-8	NV		
Naptha	5-6	V		
Stearate emulsifier	3	NV		
Water	75	-		
Propellant (Butane/Isobutane)	8	V		
Formula 2[a]			85.0-98.0	85.0-98.0
Acrylic, vinyl, or other synthetic waxes	2-15	NV		
Naptha	0-15	V		
Alcohol and other solvents	10-50	V		
Butane/Isobutane propellant	25-80	V		
Formula 3[b]			73.0	73.0
Wax	9.5	NV		
Crystalline wax, 70°C	0.5	NV		
Paraffin wax, 52°-54°C	14.0	NV		
Turpentine	33.0	V		
White spirit	40.0	V		
Colour mix	3.0	NV		

[a] Kline (1982)

[b] Chalmers and Bathe (1979)

OTHER HOUSEHOLD PRODUCTS - AEROSOLS

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
Antistatic Sprays		
3[1]	.11(CA)[2] .046(NY) .031(NJ)	NA

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

ANTISTATIC PRODUCTS - AEROSOL AND NONAEROSOL

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			0.0	0.0
Alkyl dimethyl benzyl ammonium chloride	.1-.5%	NV		
Water	99.9-99.5%	-		
Formula 2[a]			3.0	3.0
N-Acetylethanolamine	1-3%	V		
Water	97-99%	-		

[a] Gosselin (1984)

ADHESIVES[1] - AEROSOLS AND NONAEROSOLS

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
3277.5[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

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[1] Includes industrial, commercial, and consumer adhesives

[2] U.S. Bureau of the Census (1982)

[3] U.S. Bureau of the Census (1986)

ADHESIVES

	Percent By Weight	VOC Volatility	PROC Emitted(%)	Emitted(%)
Formula 1[a]			3.0	3.0
Milled pale crepe	55	NV		
Poly-beta pinene resin, m.p.70°C	41	NV		
Petroleum oil	3	V		
Polytrimethyldihydroquinoline	1	NV		
Formula 2[a]			0.0	0.0
Milled smoke rubber	42	NV		
Zinc oxide	21	-		
Dehydrogenated resin	32	NV		
Sym-di-beta naphthyl-p-phenylene diamine	1	NV		
Lanolin	4	NV		
Formula 3[a]			0.0	0.0
Polyisobutylene (high molecular weight)	60	NV		
Polyisobutylene (viscous fluid)	40	NV		
Formula 4[a]			12.0	12.0
Milled smoke rubber	29	NV		
Butadiene-styrene copolymer (70:30 ratio)	29	NV		
Hydrogenated resin ester	29	NV		
Polytrimethyldihydroquinoline	1	NV		
Petroleum oil	12	V		
Formula 5[a]			80.0	80.0
Neoprene	91.74	NV		
Magnesium oxide	3.67	-		
Zinc oxide	4.59	-		
Solids to make 20% by weight		V		
Toluene	80.0	V		

ADHESIVES (Continued)

	Percent Composition By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 6[a]			85.0	85.0
Nitrocellulose (11.4% N)	15	NV		
Camphor	6	V		
Acetone	11	V		
Ethyl alcohol 74 OP	44	V		
Amyl acetate	24	V		
Formula 7[a]			60.0	60.0
Celulose acetate butyrate (1/2 sec.)	20.0	NV		
Polyvynyl acetate	2.5	NV		
Petrex 7-75T (dry)	7.5	NV		
Dow 276-V_9	10.0	NV		
Tricresyl phosphate	2.0	V		
Alcohol (95% Tescol)	12.0	V		
Toluene	43.0	V		
Nitropropane-1*	3.0	V		

*Commercial solvent.

[a] Chalmers and Bathe (1979)

CAULKING AND SEALING COMPOUNDS - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
432.8[1]	.11 (CA)[2] .046 (NY) .031 (NJ)	NA

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[1] U.S. Bureau of the Census (1984); represents only synthetic base sealants and special performance sealants

[2] U.S. Bureau of the Census (1986)

CAULKING AND SEALANT FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			2.0	2.0
Hypalon (chlorosulfonated poylethylene polymer)	20	NV		
Elastomeric binder				
Chlorinated paraffin plasticizer	20	NV		
Asbestos or silicon dioxide extenders	10	NV		
Titanium dioxide pigment	12	NV		
Talc (extender)	8	NV		
Tribasic lead maleate	6	NV		
Rosin, MBTS, and Thiuram	0.5	NV		
Xylene	10	V		
Tributyl phosphate	9	NV		
Fractal A	3	NV		
Isopropyl alcohol	2	V		
Formulation 2[a]			20.0	20.0
Styrenated alkyd resin		NV		
Titanium dioxide	40	NV		
Calcium cardonate		-		
Asbestos fiber		-		
Xylene	20	V		
Formulation 3[a]			0.0	0.0
Polydimethylsiloxane	85	NV		
Silica	15	-		

[a] Gosselin (1985)

OTHER HOUSEHOLD PRODUCTS - AEROSOLS AND NONAEROSOLS

National Consumption (millions lb)	Population Apportionment	Geographic Multiplier
Carpet Deodorizers		
65[1]	.11 (CA)[2]	.96 (CA)[3]
	.046 (NY)	.91 (NY)
	.031 (NJ)	.91 (NJ)
Drain Openers		
17 (million gal. liquids)[1]	.11 (CA)[2]	.94 (CA)[3]
293 million lbs solid	.046 (NY)	.94 (NY)
	.031 (NJ)	.94 (NJ)

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[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

[3] Simmons (1983)

CARPET DEODORIZER

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			2.0	2.0
Sodium sulfate	<70%	-		
Sodium bicarbonate	<25%	NV		
Corn starch	<15%	NV		
Fragrance	<2%	NV		

[a] Gosselin (1984)

OTHER HOUSEHOLD PRODUCTS FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Drain Cleaners				
Formula 1 (solid)[a]			0.0	0.0
Sodium hydroxide	54.2	-		
Sodium nitrate	30.45	-		
Aluminum	4.1	-		
Inert ingredient	11.25	-		
Formula 2 (liquid)[a]			0.0	0.0
Sodium hydroxide (50% solution)	10.0	-		
Sodium hypochlorite (5% solution)	90.0	-		

[a] Kline (1982)

SHAVING CREAM - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
162.8[1]	.5[2]	.11 (CA)[3]	1.01 (CA)[4]
		.047 (NY)	1.07 (NY)
		.031 (NJ)	1.07 (NJ)

[1] CSMA (1985); estimated millions of units filled in 1984

[2] (WAIB, 1981)

[3] U.S. Bureau of the Census (1986)

[4] Based on data from Simmons (1983)

SHAVING CREAM FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emmitted(%)
Formulation 1			8.8	8.8
Stearic acid (95% purity)	2.000	NV		
Palmitic acid (97% purity)	5.800	NV		
Polyoxyethylene (2) cetyl ether	1.000	NV		
Hydroxyalkyl cellulose (Klucel HA)	0.067	NV		
Carbopol 934	0.180	NV		
Propylene glycol dipelargonate	2.750	V		
Sorbitol (70% solution)	10.000	NV		
Propylene glycol	3.300	V		
Triethanolamine	4.200	NV		
Water (deionized)	67.953	-		
Fragrance, dye	insign.	V		
n-butane	0.550	V		
n-pentane	2.200	V		
Formulation 2			8.9	8.9
Palmitic acid	1.95	NV		
Myristic acid	0.62	NV		
Myristyl alcohol	2.10	NV		
Polyoxyethylene (20) cetyl ether	5.23	V		
Lauric diethanolamide	5.23	NV		
Propylene glycol	0.82	V		
Glycerol	3.54	NV		
Triethanolamine	1.54	NV		
Water (deionized)	78.97	-		
Perfume	insign.	V		
Concentrate	97.0			
Propellant (Butane 48)	3.0	V		
Formulation 3			4.0	4.0
Stearic acid	4.0	NV		
Lauric acid	2.0	NV		
Liquid anolin (Fluilan)	1.0	NV		
Cromeen[1]	3.0	NV		
Triethanolamine	2.5	NV		
Water (deionized)	87.5	-		
Perfume	insign.	V		
Concentrate	96.0			
Butane	4.0	V		

SHAVING CREAM FORMULAS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 4			3.1	3.1
Palmitic acid	5.0	NV		
Lauric acid	1.0	NV		
Sodium lauryl sulphate	1.0	NV		
Polyethylene glycol (400) monolaurate	0.5	NV		
Polyacrylic acid (40% aq.) mol.wt 100.000	1.5	NV		
Triethanolamine	2.0	NV		
Potassium hydroxide	0.8	-		
Glycerol	5.0	NV		
Water (deionized)	83.2	-		
Perfume	insign.	V		
Concentrate	96.9			
Propellants, isobutane/propane	3.1	V		

Source: Harry's Cosmeticology (1982)

[1] Cromeen (Croda Chemicals Ltd.) is a substituted alkyl amine derivative of various lanolin acids

[2] Listed as a chlorofluorocarbon propellant, now banned. WAIB states that propane or butane are the most likely substitutes.

HAIR PRODUCTS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
Hair Spray			
270.7[1]	.63[2]	.11 (CA)[3]	.93 (CA)[4]
	.046 (NY)		.87 (NY)
	.032 (NJ)		.87 (NJ)
Mousse			
106.1[1]	.38	.11 (CA)[3]	NA
	.046 (NY)		
	.031 (NJ)		

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[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

[4] Simmons (1983)

HAIR SPRAY FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			88.1	88.1
Amphomer	1.80	NV		
AMP	0.30	V		
Monamid 716	0.10	NV		
DC 193 Fluid	0.05	NV		
Ethanol 40-1 (Anhyd)	52.75	V		
Water	10.00	-		
Methylene Chloride	--	V (Non-PROC)		
Dimethyl Ether	35.00	V		
Formulation 2[a]			97.4	82.4
Resyn 28-2930	2.50	NV		
AMP	0.20	V		
Monamid 716	0.10	NV		
DC 193 Fluid	0.05	NV		
Ethanol 40-1 (Anhyd)	47.15	V		
Water	--	-		
Methylene Chloride	15.00	V (Non-PROC)		
Dimethyl Chloride	35.00	V		
Formulation 3[b]			95.9	95.9
Gantrez ES 225 or ES 425	4.00	NV		
AMP	0.08	V		
Polyethoxylated (75 EO) lanolin	0.10	NV		
Perfume oil	0.10	V		
Solvents	75.72	V		
Isobutane/propane (90:10)	20.00	V		
Formulation 4[b]			97.5	97.5
Resyn 28-2930	1.50	NV		
AMPD	0.38	NV		
Alcohol-soluble lanolin	0.90	NV		
Isopropyl myristate	0.40	NV		
Dipropyleneglycol	0.10	NV		
Perfume oil	0.35	V		
Ethanol	96.37	V		
Concentrate	75.00			
Isobutane/propane (90:10)	25.00			

HAIR SPRAY FORMULATIONS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 5[b]			93.1	73.1
Resyn 28-2930	2.25	NV		
AMP	0.18	V		
Dimethicone copolyol*	0.12	NV		
Perfume	0.10	V		
Methylene chloride	20.00	V (Non-PROC)		
Ethanol	72.85	V		
Carbon dioxide	4.50	NV (Non-PROC)		

*CTFA; polymer of dimethylsiloxane with polyoxyethylene and/or polyoxypropylene side-chains.

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[a] Nowak et al (1985)

[b] Harry's Cosmeticology (1982)

STYLING MOUSSE FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1			24.5	24.5
Polyquaternium-4 (2% solution)	50.00	NV		
Quaternium-26	0.75	NV		
Stearmidopropyl Cetearyl Dimonium Tosylate (and) propulene glycol	0.50	V		
Cetyl Alcohol	0.50	NV		
Deionized Water	9.50	-		
Ethanol	20.00	V		

95% concentrate, 5% propane/isobutane propellant

OTHER HAIR CARE PRODUCTS - AEROSOL AND NONAEROSOL (SHAMPOOS)

National Consumption (millions lb.)	Population Apportionment	Geographic Multiplier
644.6[1]	.11 (CA)[2]	1.01 (CA)[3]
	.046 (NY)	.00 (NJ)
	.031 (NJ)	.99 (NJ)

[1] Calculated from Predicast (1984)

[2] U.S. Bureau of the Census (1986)

[3] Simmons (1983)

SHAMPOO FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			0.0	0.0
Ammonium lauryl ether sulphate	25.00	NV		
Cocoamino betaine 31-32%	25.00	NV		
Sandopan TFL conc. 48%*	4.20	NV		
Adipic acid/dimethylamino hydroxypropyl diethylenetriamine copolymer (Cartaretine F4)	3.33	NV		
Citric acid anhydrous	0.98	NV		
Water	to 100.00	-		
Formula 2			0.5	0.5
Polymer JR 30 M (CTFA: Quaternium 19) (MW = 30,000)	1.5	NV		
Miranol C2MSF (CTFA: Amphoteric 2) 70%	11.0	NV		
Sandopan DTC acid (CTFA: Trideceth-7-carboxylic acid) 90%	15.0	NV		
Ethyleneglycol distearate	2.0	NV		
Methyl p-hydroxybenzoate	0.2	V		
Propyl p-hydroxybenzoate	0.05	NV		
Protein hydrolysate	0.5	NV		
Perfume oil	0.3	V		
Water	to 100.0	-		
Formula 3			0.0	0.0
Coconut amidopropyl-3-dimethylamine betaine	5.4	NV		
Sodium lauryl sarcosinate	5.2	NV		
Ethoxylated tridecyl alcohol (20 EO)	14.0	NV		
Cationic cellulose (Polymer JR: Union Carbide)	0.5	NV		
Water	to 100.0	-		

PHARMACEUTICALS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
43.7[1]	.25[2]	.11 (CA)[3]	1.08 (CA)[4]
		.046 (NY)	.98 (NY)
		.031 (NJ)	.98 (NJ)

[1] CSMA (1984)

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

[4] Data for fungicides only (Simmons, 1983)

PHARMACEUTICAL FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Fungicides				
Formulation 1[a]			69.9-97.9	69.9-97.9
Copper undecylenate	0-5%	NV		
Undecylenic acid	2-5%	NV		
Zinc undecylenate	0-20%	NV		
Available as:				
Foam with 34.65% base		V		
Foam (aerosol) also contains:				
Ethyl alcohol	60%	V		
Menthol	0.25%	V		
Methylbenzethonium chloride	0.1%	NV		
Formulation 2[a]			78.0-90.0	78.0-90.0
Benzoic acid	1-5%	NV		
Boric acid	0-15%	-		
Salicylic acid	1-3%	NV		
Thymol	0-1%	NV		
Available as:				
Spray with 80-92% base		V		
Formulation 3[a]			97.0-99.5	97.0-99.5
Alcohol	36-50%			
Benzethonium	0.5%	NV		
Available as:				
Spray with 50-63% base/propellant		V		
May contain Salicylanilide	2.5%	NV		

[a] Gosselin (1984)

COLOGNES, PERFUMES, AFTERSHAVES - AEROSOLS AND NONAEROSOLS

	U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
Perfumes	82[1]	0.03[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA
Colognes	44	0.125	Same	NA
Aftershaves	23	0.25	Same	NA

[1] Kline (1986)

[2] A shelf survey showed that perfumes were typically 0.5 oz (.03 lb), colognes typically 2 oz (0.125 lb), and aftershaves typically 4 oz (0.25 lb)

[3] U.S. Bureau of the Census (1986)

PERFUMES, COLOGNES, AND AFTERSHAVE FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Perfumes[a]:				
Formula 1			100.0	100.0
Perfume oil[1]	15-30	V		
Denatured alcohol (SDA-40, 40-B, 39-C)	70-85	V		
Colognes[a]:				
Formula 1			100.0	100.0
Perfume oil[1]	5-10	V		
Denatured alcohol	90-95	V		
Aftershaves[b]:				
Formula 1			64.8	64.8
Polawax A 31	2.0	NV		
Menthol	0.1	V		
Alcohol 740 P	64.2	V		
Demineralized water	33.2	NV		
Perfume	0.5	V		

[1] Perfume oils can be composed of hundreds of different natural and synthetic compounds and therefore cannot be characterized.

[a] Wenningen (1986); Etheridge (1986)

[b] Gosselin et al. (1984)

PERSONAL DEODORANTS AND ANTIPERSPIRANTS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
156.0[1]	.25 lbs/unit[2]	.11 (CA)[3]	.86 (CA)[4]
		.046 (NY)	.89 (NY)[4]
		.031 (NJ)	.89 (NJ)[4]

[1] CSMA (1984)

[2] WAIB (1981)

[3] U.S. Bureau of the Census (personal communication)

[4] Simmons (1983)

DEODORANT AND ANTIPERSPIRANT FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			80.0-90.0	80.0-90.0
Alcohol (ethyl)	0->50	V		
Propellant (Butane)	0->50	V		
Antiperspirant salts (e.g., aluminum chlorhydroxide)	0-10	NV		
Deodorant agents	0-5	V		
Other [oils, humectants, suspending agents (e.g., bentonite)]	0-10	NV		
Formulation 2[a]			89.0-95.0	89.0-95.0
Propellant (Butane)	>50	V		
Talc and fillers	0-10	NV		
Alcohol (ethyl)	0-5	V		
Essential oil (fragrance)	0.1-1	V		
Humectants	0.1-1	NV		
Formulation 3[a]			90	90
Aluminum phenolsulfonate	10.0	NV		
Propylene glycol	5.0	V		
Alcohol	85.0	V		
Perfume	insign.	V		

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[a] Gosselin (1984)

OTHER PERSONAL CARE PRODUCTS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Seasonal Variation	Geographic Multiplier
				Suntan lotions
15[2]	.13[3]	.11 (CA)[4] .046 (NY) .033 (NJ)	1.0/0.0	1.16 (CA)[5] 1.06 (NY)[5] 1.06 (NJ)[5]
				Depilatories
				1.03 (CA)[5] 1.08 (NY)[5]
			1.08 (NJ)[5]	

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[1] Suntan lotions and depilatories are combined in units distributed. Until better data become available, we assume 80 percent of sales are suntan products and 20 percent depilatories (11 million units suntan products, 2.7 million depilatories).

[2] CSMA (1984); estimated millions of units filled in 1984

[3] WAIB (1981)

[4] U.S. Bureau of the Census (1986)

[5] Simmons (1983)

OTHER PERSONAL CARE PRODUCTS FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Depilatories				
Formulation 1			10.0	10.0
Thioglycolate (calcium or ammonium)	5-10	NV		
Hydroxide (calcium or sodium)	2-6	-		
Emulsifiers, humectants, waxes	0.1-1	NV		
Demineralized water	up to 100	-		
Propane/butane	up to 10	V		
Formulation 2			10.5	10.5
Calcium carbonate, light	0-21	-		
Calcium hydroxide	0-1.5	-		
Calcium thioglycolate trihydrate	2.2-6	NV		
Cetyl alcohol, flakes	0-4.5	NV		
Perfume	0-0.5	V		
Sodium lauryl sulfate	0-0.5	NV		
Sodium silicate solution	0-3.5	-		
Distilled or deionized water	up to 100	-		
Propellant: Butane/propane	10			
Suntan Lotions				
Formulation 1			0.1-1.0	0.1-1.0
Water	>50	-		
Fats, oils, waxes	10-25	NV		
Emulsifiers	1-10	NV		
Humectants	0-10	NV		
Preservatives	0.1-1	NV		
Essential oil (fragrance)	0.1-1	V		
Sunscreen agent	1-5	NV		
Formulation 2			0.0	0.0
Monoglyceryl p-aminobenzoate	3.0	NV		
Mineral oil	25.0	NV		
Sorbitan monostearate	4.0	NV		
Polyoxyethylene sorbitan monostearate	6.0	NV		
Demineralized water	62.0			

OTHER PERSONAL CARE PRODUCTS FORMULAS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 3			0.1-1.0	0.1-1.0
Oils (e.g., mineral)	>50	NV		
Emollient	1-10	NV		
Thickeners	1-10	NV		
Sunscreen agent	1-5	NV		
Preservatives	0.1-1	NV		
Color	0.1-1	NV		
Essential oil (fragrance)	0.1-1	V		
Formulation 4			65.0	65.0
Methyl anthranilate	5.0	NV		
Propylene glycol rinicoleate	10.0	NV		
Glycerol	10.0	NV		
Alcohol	65.0	V		
Water	10.0	-		
Formulation 5			0.0	0.0
2-Ethyl hexyl salicylate	5.0	NV		
Sesame oil	40.0	NV		
Mineral oil	55.0	NV		

AUTOMOTIVE CLEANERS - AEROSOLS AND NONAEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
14.7[1]	.875[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

[1] CSMA (1985)

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

AUTOMOTIVE CLEANERS - AEROSOL AND NONAEROSOL[a]

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			9.0	9.0
Water	67%	-		
Anionic and Nonionic surfactants	22%	NV		
Isopropanol	8%	V		
Glycol ether	1%	V		
Borax	1%	-		
Thickener	1%	-		
Formula 2			23.0	23.0
Inorganic polishing agents	42%	-		
Water	25%	-		
Petroleum distillates	23%	V		
Vegetable oils	5%	NV		
Detergents	5%	NV		
Formula 3			60.0	60.0
Petroleum napthas	50-60%	V		
o-Benzyl-p-chlorophenol	.1%	NV		
Petroleum and synthetic waxes	40-50%	NV		
Formula 4			0.0	0.0
Alkyl aryl sodium sulfonate	40%	NV		
Sodium sulfate	60%	-		
Formula 5			2.0	2.0
Sodium dodecylbenzene sulfonate (alkyl aryl sodium sulfonate)	40-100%	NV		
Sodium sulfate	15-25%	-		
Alkyl diethanolamine	2%	V		
Nonionic detergents	10-15%	NV		
Formula 6			0.0	0.0
Dodecyl benzene sulfonate	6%	NV		
Coconut oil amine	2%	NV		
Water	92%	-		
Formula 7			0.0	0.0
Oxalic acid	40%	-		
Boric acid	60%	-		

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[a] Gosselin (1984)

AUTOMOTIVE CLEANERS - AEROSOL AND NONAEROSOL[a] (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 8			100.0	100.0
Petroleum ethers	100%	V		

[a] Gosselin (1984)

AUTOMOTIVE ENGINE DEGREASERS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
23.9[1]	.875[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

ENGINE DEGREASER FORMULATIONS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			89.2	89.2
Ethylene dichloride (Other chlorinated hydrocarbons may be substituted, such as o-dichlorobenzene, dichloropentane, methylene dichloride, 1,1,1-trichloroethylene)	63	V		
Cresol (low-boiling cresylic acids may be substituted)	25	V		
Oleic acid	7.2	NV		
Potassium (or sodium) hydroxide	1.4	-		
Water	3.0	-		
This formulation equals 90% by weight				
Butane Propellant*	10%	V		
Formulation 2[a]			100.0	99.8
Methylene chloride	0.25	V		
Perchloroethylene	5-60	V		
Stoddard solvent	40-70	V		
Butane Propellant*	10	V		
Formulation 3			100.0	75.0-100.0
Perchloroethylene	0-60	V		
Trichloroethane	0-60	V		
Methylene chloride	0-25	V		
Petroleum solvents	40-70	V		
Chlor-aromatic solvents (see o-dichlorobenzene, chlorinated naphthalenes)	0-100	V		
Detergent	trace	NV		
Emulsifier	trace	NV		
Butane Propellant*	10	V		

*Estimated from WAIB (1981) and CSMA (1986)

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[a] Gosselin (1984)

LUBRICANTS AND SILICONES - AEROSOL AND NONAEROSOL

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
75.4[1]	.44[2]	.11 (CA)[3]	NA
		.046 (NY)	
		.031 (NJ)	

[1] CSMA (1984); estimated millions of units filled in 1984

[2] Averaged from data in WAIB (1981)

[3] U.S. Bureau of the Census (1986)

LUBRICANTS AND SILICONES - AEROSOL AND NONAEROSOL

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			0.0	0.0
Mineral oils	85-100%	NV		
Cl.SP compounds	0-10%	NV		
Isobutylene polymers	0-5%	NV		
Formula 2[a]			100.00	100.00
Colloidal graphite dispersion in aliphatic naptha	5%	V		
Oxygentated organic acids	20%	V		
Naptha (aliphatic)	65%	V		
Tricresyl phosphate	10%	V		
Nonylphenoxy acetic acid	trace	V		

[a] Gosselin (1984)

UNDERCOATING - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
8.3[1]	.75[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

UNDERCOATING FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			25-85	25-85
Pigment (15-50%)				
Iron oxide	0-50	-		
Silicates	0-50	-		
Lead or lead salts	0-50	-		
Zinc and zinc salts	0-50	-		
May contain:				
Titanium dioxide	0-50	-		
Vehicle (50-85%)				
Alkyd resin	0-50	NV		
Phenolic resin	0-50	NV		
Fish oil	0-25	NV		
Vegetable oil	0-25	NV		
Aromatic hydrocarbons[1]	0-50	V		
Aliphatic hydrocarbons[1]	0-50	V		

[a] Gosselin (1984)

[1] Assumes that at least 50 percent of vehicat consists of aromatic or aliphtic hydrocarbons

BRAKE CLEANERS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
16.6[1]	1.13[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

AUTOMOTIVE BRAKE CLEANERS - AEROSOL AND NONAEROSOL[a]

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			100.0	100.0
Methyl alcohol	100%	V		
Formula 2			100.0	100.0
Ethyl alcohol	100%	V		
Formula 3			100.0	100.0
Isopropyl alcohol	100%	V		

[a] Gosselin (1984)

TIRE INFLATOR AND SEALANT - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
19.3	.69[2]	.11 (CA)[3] .46 (NY) .031 (NJ)	NA

[1] CSMA (1985); estimated millions of units sold in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

CARBURETOR AND CHOKE CLEANER - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
39.8[1]	.75[2]	.11 (CA)[3] .047 (NY) .031 (NJ)	NA

[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

CARBURETOR CLEANER FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formulation 1[a]			66.9	66.9
Ethylene dichloride (Other chlorinated hydrocarbons may be substituted, such as o-dichlorobenzene, dichloropentane, and methylene dichloride)	56.2	V		
Cresol (low-boiling cresylic acids may be substituted)	22.3	NV		
Oleic acid	6.4	NV		
Potassium hydroxide (sodium hydroxide)	1.2	-		
Water	3.0	-		
Butane propellant*	10.7	V		
Formulation 2[a]			100.0	100.0
Aliphatic or Aromatic hydrocarbons with oil soluble wetting agents	88	V		
Butane*	12	V		
Formulation 3[a]			28.0-72.0	28.0-72.0
Tall Oil	5-18	NV		
Cresol	10-25	NV		
Potassium Hydroxide	1-4	-		
Ethylene dichloride	15-50	V		
Sodium chromate	.5-5	-		
Ammonium oxalate	.3-3	NV		
Alcohol	1-10	V		
Water	10-40	-		
Butane*	12	V		

[a] Gosselin (1984)

*Estimated from WAIB (1981) and CSMA (1986)

ENGINE STARTING FLUIDS - AEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
30.8[1]	.56[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

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[1] CSMA (1984); estimated millions of units filled in 1984

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

AUTOMOTIVE STARTING FLUIDS - AEROSOL AND NONAEROSOL[a]

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			100.0	100.0
Ethyl Ether	100%	V		

[a] Gosselin (1984)

AUTO WINDSHIELD WASHER FLUID AND DEICER

	U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
Windshield Washer Fluid				
	NA	NA	.11 (CA)[3] .046 (NY) .031 (NJ)	NA
Windshield Deicer				
	10.4[1]	1[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	NA

[1] CSMA (1985)

[2] WAIB (1981)

[3] U.S. Bureau of the Census (1986)

AUTO WINDSHIELD DEICER FORMULATION

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1			75.0	75.0
Isopropyl alcohol	25	V		
Ethylene glycol	50	V		
Water	25	-		
Propellant, CO_2		V		
Formula 2[b]			100.00	100.00
Isopropanol	90-95	V		
Isobutone propellant	5-10	V		
Formula 3[b]			76.3	71.3
Isopropanol	23.8	V		
Ethylene glycol	47.5	V		
Water	23.8	-		
Propellant, CO_2	5.0			
Formula 4[b]			95.0	95.0
Isopropanol	30-100	V		
N-propanol, propyleneglycol, ethylene glycol	15-30	V		
Water	5-15	-		

[a] Chalmers and Bathe (1979)
[b] Gosselin (1984)

HERBICIDES AND FUNGICIDES - AEROSOL AND NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
69[2]	.11(CA)[3] .047(NY) .031(NJ)	NA

[1] Kline (1981)

[2] U.S. Bureau of the Census (1986)

HERBICIDES AND FUNGICIDES - AEROSOL AND NONAEROSOL[a]

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Herbicides				
Formula 1			95.0	95.0
Aromatic hydrocarbons (primarily xylenes)	95%	V		
Inert ingredients	5%	NV		
Formula 2			59.2	59.2
Bromocil	40.8%			
Inert ingredients (including an ethanol amine)	39.2%			
Formula 3			0.0	0.0
Bromocil	4%	NV		
Granular mineral base	96%	NV		
Formula 4			30.0	3.0
Monuron	17.69%	NV		
Trichloracetate acid	14.56%	NV		
Aromatic petroleum solvent	20-30%	V		
Dodecylbenzene sulfonic acid, corrosion inhibitor, and inert ingredients	35-45%	NV		
Formula 5			22.0	22.0
4-amino-3,5,6-trichloropicolinic acid, isoctyl esters	15.1%	NV		
2,4,5-trichlorophenoxyacetic acid, propylene glycol butyl ether esters	63.4%	NV		
Inert ingredients (aromatic petroleum solvent, methanol)	0-21.5%	V		
Formula 6			80.0	8.0
Urox liquid oil concentrate	18-20%	NV		
Heavy aromatic naptha	80-82%	V		

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[a] Gosselin (1984)

HERBICIDES AND FUNGICIDES - AEROSOL AND NONAEROSOL (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 7			0.0	0.0
4-amino-3,5,6-trichloropicolinic acid, potassium salt	2.3%	NV		
Disodium tetraborate pentahydrate	79.2%	-		
Disodium tetraborate decahydrate	16.5%	-		
Formula 8			38.0	38.0
Picloram, isooctyl esters	62.4%	NV		
Heavy aromatic naptha, methanol	0-37.6%	V		
Formula 9			0.0	0.0
Sodium metaborate tetrahydrate	68%	-		
Sodium chlorate	30%	-		
Inert ingredients	2%	NV		
Formula 10			0.0	0.0
Sodium metaborate tetrahydrate	66.5%	-		
Sodium chlorate	30%	-		
Bromacil	1.5%	NV		
Inert ingredients	2%	NV		
Formula 11			93.0	93.0
Aliphatic petroleum distillates	83.27%	V		
Xylene	9.65%	V		
2,4-Bis(isopropylamino)-6-methoxy-5-triazine	.86%	NV		
Inert ingredients	6.22%	NV		
Fungicides				
Formula 12			0.0	
Copper sulfate	50%	-		
Lime	50%	-		

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[a] Gosselin (1984)

HERBICIDES AND FUNGICIDES- AEROSOL AND NONAEROSOL (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 13			30.0	30.0
Copper	8%	-		
Copper naphthenate	70-80%	NV		
Petroleum distillate	20-30%	V		
Formula 14			45.0	45.0
Zinc naphthenate	55-60%	NV		
Petroleum distillate	40-45%	V		
Zinc	8%	-		

[a] Gosselin (1984)

HOUSEHOLD POLISH FORMULATIONS - AEROSOL AND LIQUID

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Liquids				
Formula 1			70.0	70.0
Hard waxes	13	NV		
Microcrystalline wax	8	NV		
Silicone fluid	9	NV		
Naphtha or turpentine	70	V		
Formula 2			94.0	94.0
Hard waxes	3	NV		
Microcrystalline wax	1	NV		
Silicone fluid	2	NV		
Naphtha or turpentine	94	V		
Formula 3			24.0	24.0
Carnauba wax	4.2	NV		
Beeswax	2.2	NV		
Microcrystalline wax	.7	NV		
White spirit or naptha	24.0	V		
Stearic acid	2.5	NV		
Triethanolamine	1.7	NV		
Water	64.7	-		
Formula 4			25.76	25.76
Carnauba wax	5.00	NV		
Beeswax	1.76	NV		
Microcrystalline wax	.70	NV		
White spirit or naptha	24.00	V		
Stearic acid	2.81	NV		
2-Amino-2 methyl-propanol	1.76	V		
Water	63.97	-		
Formula 5			28.5	28.5
Hoechst Wax O	2.0	NV		
Ceresin	1.5	NV		
Silicone fluid 220/350 cS	2.5	NV		
Span 80	1.5	NV		
White spirit:turpentine 1:1	28.5	V		
Deionized water	64.0	-		
Perfume	q.s.	V		

HOUSEHOLD POLISH FORMULATIONS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 6			37.0	37.0
Hoechst Wax	8.0	NV		
Oleic acid	1.3	NV		
Morpholine	1.0	V		
White spirit	36.0	V		
Silicone oil 350 cS	1.5	NV		
Silicone oil 10 000 cS	2.0	NV		
Deionized water	50.2	-		
Perfume	q.s.	V		

[a] Kline (1982)

FLOOR POLISHES AND WAXES - NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
27[1]	.11 (CA)[2]	1.04 (CA)[3]
	.046 (NY)	1.02 (NY, NJ)
	.031 (NJ)	

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

[3] Simmons (1983)

FLOOR WAX AND POLISH FORMULATIONS - NONAEROSOL

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			0.2	0.2
Rhoplex B 38%-a	31.58	NV		
Polyethylene, 40%	5.63	NV		
Diethylene glycol monomethylether	4.00	NV		
ACRYSOL leveling aid, 42%	1.79	NV		
Tributoxyethyl phosphate	1.00	NV		
Dibutyl phthalate	1.00	NV		
Formalin, 37%	0.15	V		
Wetting agent, 1%	0.40	NV		
Silicone defoamer	0.01	NV		
Water or inorganic base to 100%				
Formula 2[a]			0.2	0.2
Rhoplex B 38%-a	37.89	NV		
Polyethylene, 40%	6.75	NV		
Diethylene glycol monomethylether	2.40	NV		
ACRYSOL leveling aid, 42%	2.14	NV		
Anionic surfactant, 35%	1.43	NV		
Tributoxyethyl phosphate	1.20	NV		
Formalin, 37%	0.15	V		
Wetting agent, 1%	0.60	NV		
Silicone defoamer	0.02	-		
Water or inorganic base to 100%				
Formula 3[a]			0.2	0.2
Rhoplex B 38%0a	64.74	NV		
POLYETHYLENE, 40%	11.25	NV		
Diethylene glycol monomethylether	6.00	NV		
ACRYSOL leveling aid, 42%	2.14	NV		
Tributoxyethyl phosphate	1.37	NV		
Formalin, 37%	0.15	V		
Wetting agent, 1%	0.72	NV		
Silicone defoamer	0.03	-		
Water or inorganic base to 100%				

[a] Chalmers and Bathe (1979)

METAL CLEANERS AND POLISHES - NONAEROSOL

National Consumption (millions lb)	Population Apportionment	Geographic Multiplier
24[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.031 (NJ)	

[1] Kline (1982)

[2] U.S. Bureau of the Census (1986)

METAL CLEANER AND POLISH FORMULAS - NONAEROSOLS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			2.0-5.0	2.0-5.0
Abrasive	5-35	NV		
Soap or synthetic surfactants	5-7	NV		
Thickening agent	.5-1	NV		
Ethyl or isopropyl alcohol	2-5	-		
Water, to make	100%			
Formula 2[a]			0.0	0.0
Dithio-bis-stearyl propionate	5.0	NV		
Abrasive	20.0	NV		
Surfactant	6.0	NV		
Preservative	0.1	NV		
Water, to make	100.0	-		
Formula 3[b]			0.0	0.0
Sulfamic, citric, tartaric acid	5-10	NV		
Sodium chloride	5-10	-		
Anionic synthetic surfactant	1-3	NV		
Siliceous abrasive	to 100	-		
Formula 4[b]			0.0	0.0
Caustic soda or potash (see alkali)	0-50	-		
Trisodium phosphate	25-75	-		
Sodium metasilicate	10-75	-		
Soap or detergent (alkly aryl sodium sulfonate)	5-20	NV		
Formula 5[b]			100.0	1.0-100.0
Perchloroethylene	1-100	V		
Trichloroethylene	1-100	V		
1,1,1-Trichloroethane	1-100	V		
Formula 6[b]			55.0-90.0	55.0-90.0
Kerosene	5-80	V		
Potassium soap of oleic acid	5-25	NV		
Glycol ether	5-20	V		
Surfactant	5-20	NV		

METAL CLEANER AND POLISH FORMULAS - NONAEROSOLS (Continued)

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 7[b]			0.0	0.0
Hydrochloric acid or one or more of the following:		-		
Sulfuric acid	5-25	-		
Chromic acid	5-20	-		
Phosphoric acid	10-25	-		
Citric acid	10-25	-		
Surfactant	5-10	NV		

[a] Kline (1982)

[b] Gosselin (1985)

AUTOMOTIVE ANTIFREEZES - NONAEROSOL

National Consumption (million lb)	Population Apportionment	Geographic Multiplier
22.3[1]	.11 (CA)[2]	NA
	.046 (NY)	
	.031 (NJ)	

[1] CSMA (1983)

[2] U.S. Bureau of the Census (1986)

A/834-025-68b/#5

AUTOMOTIVE ANTIFREEZE FORMULAS

	Percent By Weight	Volatility	VOC Emitted(%)	PROC Emitted(%)
Formula 1[a]			95.0	95.0
Glycols (95% monoethylene glycol, 5% kiethylene glycol)	95	V		
Alkali metal borates and phosphates	2-3	-		
Water	2-3	-		
Dye	trace	V		

[a] Gosselin (1985)

CAR POLISHES AND WAXES - NONAEROSOLS

U.S. Annual Unit Distribution (millions)	Average Unit Weight (lb/unit)	Population Apportionment	Geographic Multiplier
189.1[1]	1[2]	.11 (CA)[3] .046 (NY) .031 (NJ)	1.05 (CA)[4] .90 (NY) .90 (NJ)

[1] Calculated from Simmons (1983)

[2] Based on a shelf survey of several different brands and formulations

[3] U.S. Bureau of the Census (1986)

[4] Simmons (1983)

A/834-025-68b/#5

CAR WAX FORMULATIONS

	Percent Composition by Weight	VOC Volatility	PROC Emitted(%)	Emitted(%)
Formula 1[a]			42.4	42.4
Carnauba wax	5.1	NV		
Beeswax	4.5	NV		
White spirit or naptha	42.4	V		
Stearic acid	4.0	NV		
Triethanolamine	1.5	NV		
Water	42.5	-		
Formula 2[a]			42.3	42.3
Carnauba wax	5.00	NV		
Beeswax	2.00	NV		
Ceresin	2.00	NV		
White spirit or naptha	40.00	V		
Triethanolamine	2.25	V		
Stearic acid	4.00	NV		
Water	44.75	-		

[a] Chalmers and Bathe (1979)

APPENDIX B

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